Telephony

November 16, 1935

IMPROVING TRANSMISSION In the Small Telephone Plant

By OTTO K. HENRY

FIRST OF A SERIES of five articles of great interest to the maintenance men of the smaller exchanges. Improper maintenance of plant the major cause of inferior telephone service in the rural community. Conductivity, the most important factor in good transmission, is impaired by high resistances. Simple method of testing to locate the high resistances

A FEW DAYS ago I heard one of our business men trying to hold a conversation on the telephone with a subscriber on another exchange some 20 miles in the country. The transmission was so poor that it was necessary to have the operator at the terminating point repeat the message, although the operator and the calling party could converse perfectly.

With modern telephone equipment there is practically no limit to the distance over which we can transmit our voice; the only limit encountered is the limit of equipment. It would be perfectly possible for us to send our voice around the world an unlimited number of times, if the equipment were available and in perfect working order. Therefore, distance is no longer a barrier to telephone conversations.

With this fact in mind, it is an absurdity that this business man should be unable to hold a conversation with this party only 20 miles away.

A great many of our rural sections have been sadly negelected in regard to telephone service. The failure of the farmer or small exchange subscriber to obtain service comparable to the city subscriber may be attributed to many causes, but it finally simmers itself down to the fact that his telephone equipment is not maintained in such a manner as to give him a real, commercial grade of service.

The telephone industry has no apology to make for the existence of this condition. We are rendering an indispensable and necessary service to millions of users; and we have a class of equipment which, when maintained in good order, will give a type of service entirely satisfactory to these millions.

The very fact that we who maintain adequate service conditions are sometimes at the mercy of those who are negligent in their maintenance methods, should inspire us to direct our efforts to assist these negligent parties to improve their conditions.

Recently I heard it said by a man, who had spent several years as the chief engineer of our public service commission and who is now the operator of public utility properties, that in his opinion there is no phase of the telephone business which merits greater consideration than the rural or small exchange problem.

It is here that our greatest development and improvement—from a service standpoint—is possible; and this development and improvement is largely in the hands of the owners and operators of these properties. I say "largely in the hands of the owners and operators of these properties," because the quality of service given depends entirely upon the condition in which they maintain these properties.

The business man mentioned in the first paragraph was unable to hold a conversation with his rural party only because of a lack of proper maintenance of equipment in connection with the called telephone. Every unsatisfactory telephone connection must be the result of the failure of some part of the connected equipment to function properly; otherwise the service would be perfect.

This being the case, the quality of service is in direct relation with equipment conditions. If this statement is true—and most of us know that it is—then the solution lies in educating these owners and operators to the fact that the solution of their problem is quite largely a matter of maintenance of their property.

Since we of the telephone business have nothing to offer but service, what right have we to an existence in this business if we fail to provide that service?

Our major objective, then, is that of providing a means of communication to the satisfaction of the public; and in order to provide a means of communication to the satisfaction of the public, our problem becomes one of speech transmission.

Perhaps no phase of telephone operating has been more grossly neg-

lected by the small plant operator than transmission, in spite of the fact that this is his whole stock in trade. His success depends primarily upon his ability to provide satisfactory speech transmission. You may say what you please about rates, public relations, etc., but of what will these things avail you if you do not first have the facilities for providing a satisfactory service?

In the small magneto exchange, conductivity is by far the most important factor in good transmission. Therefore, our chief problem becomes one of providing low resistance paths for the weak voice currents to follow on their way from one station to another. This condition is most frequently made impossible because of poor connections somewhere along the line, this "somewhere" being most frequently in the line wire.

Our first consideration, then, must be that of locating these high resistance joints and replacing them with good joints of little or no resistance. Our best way of doing this is to first obtain a general view of plant conditions, and note the various lines upon which these poor joints exist, as well as the exact location on each particular section of line.

This is best done by what is known as conductivity tests. The method of making these tests and the equipment necessary are so simple and inexpensive—and the value so great—it is hard to realize that so few small plant operators have ever made use of it.

In making these conductivity tests, great care should be taken to see that they are made under actual conditions. This is important, since magneto lines carry no direct currents, but rather weak, high-frequency voice-currents that are unable to "burn good" any loose joints which might instantly "tighten up" under a greater voltage.

To meet these conditions, instrument manufacturers are able to supply meters designed to operate on current as low as three volts. A three-volt battery is hardly likely to "burn good" any loose connection. Since reliable meters are available to operate on this voltage, there is no doubt that this is the correct principle for all routine tests on magneto lines.

To eliminate the necessity of any arithmetical calculations, it is advisable to use meters calibrated to read resistances directly in ohms. These can be purchased so designed as to read from 0 to several thousand ohms.

Outside Plant Survey, Conductivity Tests. Single Subscriber Lines. — Blanktown Telephone Co., Blanktown, Ind.

	1-2-35				3-3-35				5-4-35			
Tel. No.	Total Ohms.	Ringer	Line Ohms.		Total Ohms.	Ringer.	Line Ohms.		Total Ohms.	Ringer.	Line Ohms.	
1	1580	1000	580		1590	1000	590		1580	1000	580	
2	1310	1000	310		1480	1000	480	*	1620	1000	620	*
3	330	80	250		320	80	240		330	80	250	
4	1516	1000	560		1560	1000	560		1560	1000	560	
5	1440	500	940	✓	750	500	250		750	500	250	
6	1410	1000	410		1420	1000	420		930	500	430	
7	1860	1000	860	✓	1330	1000	330		1350	1000	350	
8	120	80	40		120	80	40		120	80	40	
9	1520	1000	520		1780	1000	780	✓	1420	1000	420	
10	1260	1000	260		1250	1000	250		1270	1000	270	

Fig. 1. Form Suitable for Keeping a Record of Conductivity Tests on Magneto Lines.

We shall now describe in detail the method of making a routine conductivity test in a magneto exchange. First, lash your portable meter to two new No. 6 dry cells, connecting the batteries and meter in series—with the positive post of one cell connected to the positive post of the meter, and the negative post of the other cell to the three-volt post of the meter. Then connect the other two posts of the dry cells to a cord and plug, making sure the cord is a good one of a low-resistance type.

After short-circuiting the plug, the meter should indicate a full three volts' or zero resistance. You may now plug into any line and read directly its resistance. If the needle is "dead beat" and comes to rest instantly, the line resistance may be called off rapidly.

Before making the following described test it is advisable, if you are not sure, to see that the line coil is removed from the line circuit when the plug is inserted into the line jack. If it is either in series or in multiple with the line, it will have to be taken into account in the test, complicating matters. Since the line coil is removed from the circuit when the plug is inserted in the line jack of all modern switchboards, we shall disregard it in this description.

It is also advisable that some sort of a record be kept of the tests as they are made. In this manner it is possible to have a continuous record of each line as each future test is made. It will be found to be a very valuable record, as each test will disclose any changes that have taken place in the line which may indicate approaching trouble.

A form which we have found to be quite suitable for this purpose is shown in Fig. 1. It can be easily made with a typewriter on any 8½ by 11-inch paper and filed in a loose-leaf binder for ready reference.

These tests should be made periodically, as conditions require—probably every two or three months. If a close check is desired, the tests might be made every month.

Now let's proceed to make the test: First, short-circuit the plug, to be sure the voltage is correct and that the reading indicates zero resistance. Then insert the plug in the line jack of line No. 1.

In this case we shall assume that the reading is 1,580 ohms as shown on Fig. 1. We know the ringer resistance of this telephone to be 1,000 ohms. Therefore, when this amount is deducted from 1,580, we know our line resistance to be 580 ohms. As the tests are being made, the various readings should be written down in the proper columns provided on the record sheet.

Should such a condition arise as is shown with line No. 2 (Fig. 1), it is a positive indication that something is happening to this line which will result in poor transmission if not corrected. This gives us an opportunity to correct the condition before it results in serious trouble.

In connection with lines Nos. 5 and 7 we have a clear case of high resistance, resulting in poor transmission, as we have exceeded the transmission limit of 750 ohms. For instance, on line No. 5 our test showed a total resistance of 1,440 ohms. After deducting 500 ohms for the ringer we have 940 ohms remaining, indicating 190 ohms in the line in excess of the 750 ohms' transmission limit.

The test made two months later revealed that the line then had a resistance of only 250 ohms, showing the line to be in fine transmission condition, as far as resistance was concerned. The same condition was revealed on line No. 7. Line No. 9 developed resistance trouble during January and February, as was discovered in the test of March 3, when it was corrected. Some time during March and April the telephone was changed on line No. 6. The telephone removed had a ringer resistance of 1,000 ohms, while the telephone in-

stalled had a ringer of 500 ohms' resistance. The record was changed accordingly.

If all telephones in town have 1,000-ohm ringers, it is no trick at all to know that any line showing a reading of more than 1,750 ohms has gone beyond the ohmic transmission limit. In other words, such lines show a resistance exceeding that of 22 miles of No. 12 B.B. iron wire, although, in reality, they may not exceed a quarter of a mile in length.

The reason for this condition may be anything from deteriorated wire that resembles "a streak of rust" to an otherwise perfectly good line that has temporarily developed a high resistance because of neglect to solder a certain joint.

Suppose we take a line reading in excess of 1,750 ohms and proceed to clear it up. The line selected, we shall say, reads 1,840 ohms. From this figure we subtract 1,000 ohms for the ringer, leaving us a line of 840 ohms. This line we know to be three-quarters of a mile in length, of which 230 feet are of No. 22 gauge cable, the remainder being No. 14 B.B. iron wire. The line is metallic.

Our cable will be practically without resistance. Since No. 22 gauge cable has a resistance of 0.0325 ohm per metallic foot, the entire length of the cable will give us a resistance of less than one ohm. If a short-circuit at the terminal should show resistance, it must be either between the terminal and the exchange, or in the office.

Assuming that this line is exactly three-quarters of a mile in length, we should have a line resistance of approximately 90 ohms. With a line reading of 840 ohms, this line contains over nine times the resistance it should have. Surely good transmission could hardly be expected under these conditions.

The routine tests for rural lines are made in practically the same manner as for city lines. The party making the test, however, should first go in on the line, to be sure there is no line conversation taking place, for this would, of course, give incorrect results.

A different form should be used for recording these results, since simple arithmetical calculations are necessary to arrive at the actual conditions. Fig. 2 shows a form suitable for rural line testing.

Some of the older telephone men will contend that a resistance reading on a rural line will be of little value when the complicated nature of the resistance network, due to widely-scattered subscriber stations, is taken into account. This, however, has been disproved in a number of cases, since for all practical purposes the length of the line, as determined by the following method, has been found to approximate the center of the subscriber group.

After getting the total resistance reading of the line with all receivers on the hook, divide the ringer resistance by the number of ringers and subtract this from the total resistance reading. The remainder may be taken as indicating the line resistance to the center of distribution. In other words, the result will be practically the same as that which would be obtained if all ringers were "shorted out" and a reading taken.

Suppose we take the figures for line No. 501 as shown in Fig. 2. Here we have five stations with 1,600-ohm ringers. Dividing 1,600 by five we obtain a collective ringer resistance of 320 ohms across the line. If our line reading totals 980 ohms, from which we deduct the 320-ohm ringer resistance, we find we have an actual line resistance of 660 ohms.

Outside Plant Survey.
Conductivity Tests.
Rural Lines.

Blanktown Telephone Co.
Blanktown, Indiana.
Date of test

Line. No.	Stations No.	Stations Ohms.	Total Ohms.	Line Ohms.	Miles Tested.	Miles Actual.	Miles Excess.	Wire Size.	Remarks.
501	5	320	980	660	10	8	2	12	Metallic
502	7	228	616	388	6	5	1	"	"
503	9	177	673	496	15	12	3	"	Ground
504	8	200	1190	990	30	15	16	"	" ✓
505	5	320	800	480	7	7	0	"	Metallic
506	7	228	650	422	6½	6	½	"	"
507	6	266	660	394	6	6	0	"	"
508	4	400	670	270	4	4	0	"	"
509	8	200	600	400	6	7	-1	"	" ✓
510	10	160	751	591	18	15	3	"	Ground
511									

Fig. 2. Suggested Form for Use in Keeping a Record of Tests Made on Rural Lines.

We know this to be a metallic line of No. 12 B.B. iron wire, having a resistance of 66 ohms per metallic mile. Dividing 660 by 66 we can plainly see we have a line resistance equaling 10 miles.

In this case we will say that we know from actual measurements that the center of distribution on this line is eight miles out. Therefore, we know we have an excess of two miles or approximately 132 ohms. Now 132 ohms excess might not be a serious matter on some lines but in this case 660 ohms comes within 90 ohms of being the 750-ohm limit. It might be best then to determine where the excess 132 ohms is and remove it. Surely it would improve the service on this line.

If there is any doubt as to the actual center of distribution, it can easily be determined by checking the distance from the central office to each subscriber with the trip reading on your speedometer. Add these together and divide by the number of stations, and the result will be the center of distribution.

On line No. 504 we have eight ringers of 1,600 ohms resistance each, resulting in 200 ohms across the line. Our test reading is 1,190 ohms, from which we subtract 200, leaving us an actual line resistance of 990 ohms. This line has a center of 15 miles but we divide 990 by 33, the resistance of No. 12 B.B. single iron wire per mile, and we have a line 30 miles long. This is an excess of 15 miles.

Clearly something is wrong here, since we have a line twice as long as it should be and we have exceeded our transmission limit of 750 ohms by 240 ohms. Beyond any question whatever, this is a case requiring immediate attention.

On line No. 509 we have eight ringers, resulting in a parallel resistance of 200 ohms. Our test reading is 600 ohms, from which we subtract 200, leaving an actual line measurement of 400 ohms. When this is divided by 66 we have a center of distribution six miles out, but we happen to know that this point is seven miles from the exchange.

Here is a condition the exact opposite from line No. 504. This is the very best of evidence that we have a high resistance to ground somewhere on the line, probably a bad tree ground or smutty carbon in a lightning arrester.

In all direct-current measurements it should be remembered that any leakage will have a tendency to lower the resistance below what it otherwise would have been. Therefore, it is just as important to watch for these conditions as for an indication of excess resistance. Both, though of different nature, are fatal to good transmission.

Every live telephone man wants to know his actual plant conditions, and

there is nothing to tell the story like these routine conductivity tests. These tests will single out to his attention the very parts of his plant contributing to poor service, giving him a place from which to start on his crusade against poor service.

Even though he may only want to know the actual conditions as applied to the plant as a whole, these tests provide a means by which this condition may become known. The first thing to do is to complete the tests, noting the number of lines exceeding the 750-ohm transmission limit. If we have 200 lines in the exchange and find 25 of them to exceed the transmission limit, we know immediately that 12½ per cent of our plant is giving service below the commercial standard.

Our next step is to average the line resistance on those lines of less than 750 ohms and divide this result by what the average resistance should be. This will give us a percentage above 100, all above 100 per cent representing excess resistance.

In our exchange of 200 lines we found 12½ per cent of them to be furnishing service below the accepted standard. The remaining 175 come somewhere within the standard which we wish to determine. If the remaining 175 lines average 325 ohms—whereas they should average not over 160—we know that the remaining 87½ per cent of our plant is furnishing service 30 per cent of what it should be.

In this day and age when efficiency and cold figures have taken the place of generalities and guesswork, real telephone men should welcome any means by which they may know exactly where they stand in regard to the quality of service they are giving.

The conductivity tests as outlined in the foregoing give every small telephone plant operator the opportunity to determine for himself the transmission qualities of his plant. Then, if he is not satisfied with the conditions disclosed, he has a basis from which to work in his efforts to improve his standards.

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Big Decrease in Non-Payment Removals

The South East Public Service Corp. of Virginia, with headquarters in Charlottesville, reports that during the first nine months of 1935 the stations removed for non-payment of rentals totalled 78 per cent less than in the same period in 1934. Says the South East Division News in commenting upon this statement:

"This is a fine record, reflecting better business conditions of course, but it is also indicative of the fact that we did not let so many get away via the 60 and 90-day delinquent route."

The Operators' Corner

By MAYME WORKMAN

Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

RECENT revision in handling collect calls when a report is received, "No one here to accept the charge." Series No. 218

IN SOME CASES when we announce a collect station-to-station call, the called station reports that there is no one there who will accept the charge. In a case of this kind, or in a case where the acceptance of the charge has not been secured at the end of the time allowance for holding the toll circuit, the report or an explanation is entered on the ticket and we say to the calling station, for example: "No one is there now who will accept the charge. Will you pay for the call?" or, "I am unable to get anyone to accept the charges. Will you pay for the call?" as the case requires.

We have recently received the following additional instructions: "If the calling party asks you to try the call later or to hold the ticket until a request is received to try the call, tell him that if such action is taken, it will be considered as a new call. If the calling party asks why further attempts will be considered as a new call, connect him with your supervisor.

"The supervisor will explain that on a collect call if the called station (or party, as the case may be) will not accept the charge and the calling party does not agree to pay for the call, a report charge is made for the effort to complete the call. Also, that any later attempt to secure the acceptance is subject to an additional report charge if the called station is reached, but the connection is not completed.

"If the calling party still wishes the action taken, the operator will release the calling line and say to the called station, 'That is all, thank you,' and clear the toll circuit. She will enter 'CA (time)' on the face of the ticket at the top and draw a line through 'Col.'

"In addition, if the day station-to-station rate is 20 cents or more, she will print 'P' in the called 'Person' space, draw a line through 25 (5) if entered on the back of the ticket, and underline the report received from the called station. Then write a new ticket, enter 'AG (time)' in the 'Special Instruction' space or 'hold for ag' on the back of the ticket, as the case requires.

"After this action has been taken, the operator will file the original ticket and send the ticket to the proper point-to-point position."

Questions from Illinois Operators

1. On a "By" call, may we hold the circuit longer than five minutes if the calling party is in a hurry for the call?
2. Should a report of extension BY, OD or DA be a chargeable or non-chargeable report?
3. What should one do if you have asked a party for a line and they ignore your request? Should you give them time to finish and if they do not give up the line should you disconnect them?
4. If the long distance operator gives you a busy signal, how long should you wait before trying the call again?
5. A report, "no one to accept charge" is received on a station-to-station collect call. Is there a chargeable report? If the call is completed, does it take the person-to-person rate?

The answers to these questions are given on page 16.

THE EVER-INCREASING TAX BURDEN

By FRANK L. McKINNEY

Secretary-Treasurer, Ohio Independent Telephone Association

INVESTIGATION into tax situation conducted by Ohio Independent Telephone Association makes astonishing revelations concerning multiplicity of separate tax items that must be passed on to consumer. Estimated that one out of every three dollars in revenue goes to pay taxes. Urgent need for campaign of education to estop the levying of taxes. Report presented at the recent district meetings of the Ohio association

THAT the tax burden carried by telephone subscribers has mounted to an exorbitant proportion of the total charges collected by our companies for service, we have known for many years. Recently, in anticipation of the special tax session of the legislature to be held this month, the Ohio Independent Telephone Association has undertaken an investigation into the number of separate tax items, direct and indirect, that we are required to pass on to the consumer.

The results of this study have been amazing, even to association officers and directors, familiar as they are with the oppressive burden of taxation that is paid annually by their own companies. To date we have compiled records to show that no fewer than 94 separate "bites" are taken by taxing authorities out of the rental charges collected for every telephone that we have in service throughout Ohio.

In the past we have estimated that approximately 13 cents plus out of every telephone dollar went for tax purposes, leaving only 87 cents to pay the cost of producing the service, maintaining the plant, and paying something for the money employed by the industry. In the light of our current researches, which have gone all the way back to the mine and the forest, we must revise our figures to show a much higher percentage for taxes.

The following are the tax items that we have been able to definitely tie into the rates that subscribers must pay for telephone service:

Taxes paid directly by Ohio operating telephone companies, nine in number, as follows:

FRANK L. McKINNEY

Real estate tax
General property tax
Gross income tax (excise)
Poor relief tax (excise)
Automobile license tax
Federal income tax
Capital stock tax
Gasoline tax
Public utilities commission tax

Taxes, 14 in number, are paid by the transportation companies handling all of the equipment, supplies and other materials for telephone companies, and are passed on to the latter in the rates charged for freight, express and other transportation services:

Real estate tax by city
Real estate tax by school district
Real estate tax by county
Real estate tax by state
General property tax
Gross income tax (excise)
Federal income tax
Capital stock tax
Communications tax
Public utilities commission tax
Franchise tax
Sales tax
Gasoline tax
Motor vehicle license tax

Taxes paid by equipment manufacturers and reflected in the prices that telephone companies must pay for the finished product, amounting to 14, are as follows:

Real estate tax
Personal property tax
Federal corporation income tax
Gasoline tax
Motor vehicle license tax
Franchise tax
Municipal tax
County tax
Foreign corporation tax (states)
Occupational license tax
Sales tax
State income tax
Capital stock tax
Electricity tax

Taxes paid by producers of poles, crossarms, brackets and other wooden products, and included in the prices charged to telephone operating companies, 11 in number, are:

State income tax
Federal income tax
Real estate tax
Personal property tax
Stumpage tax
Gasoline tax
Motor license tax
Communications tax
Capital stock tax
Sales tax
Occupational license tax

There are 13 taxes collected from those who supply wire, cable, hardware, protection, batteries, and other products from ore and minerals and are passed on to the operating telephone companies and to telephone subscribers. They involve:

Federal income tax
State income tax
Real estate tax
Personal property tax
Depletion tax
Gasoline tax
Motor vehicle license tax
Capital stock tax
Customs tax
Sales tax
Occupational license tax
Communications tax
Electricity tax

Taxes paid by producers of mechanical transportation essential to telephone operation, and entering into the cost of such products to telephone systems are 16 in number. They are:

Automobile manufacturers tax
State income tax
Federal income tax
Capital stock tax
Gasoline tax
Motor vehicle license tax
Electricity tax
Communications tax
Franchise tax
Real estate tax
Personal property tax
Foreign corporation tax (states)
Occupational license tax
Sales tax
Customs tax
Cotton processing tax

There are 10 taxes paid by dealers in general lines who provide our printing, office furniture, comptometers, accounting devices, etc., all of which are necessarily a part of the prices paid for such items, namely:

State income tax
Federal income tax
Gasoline tax
Real estate tax
Motor vehicle license tax
Electricity tax
Personal property tax
Sales tax
Occupational license tax
Capital stock tax

Taxes paid by personal service individuals and corporations including attorneys, engineers, certified public accountants, and others employed by operating telephone companies, and always considered by them in connection with the fees and charges collected from the companies. There are seven of these taxes, as follows:

State income tax
Federal income tax
Gasoline tax
Motor vehicle license tax
Real estate tax
Personal property tax
Sales tax

These 94 separate tax items must not be considered as the total tax burden carried by telephone service charges and rentals. Numerous items, paid by various individuals and companies, in addition to those quoted, have been disregarded, for the reason that they are not of widespread and general application.

In addition to the amounts actually paid to the government and its subdivisions, by operating companies and their associates in the transportation, manufacturing, production, fabrication and distributing fields, the tremendous increase in expenses (due to heavier accounting costs growing out of the multiplicity of reports) must be added to the total tax bill that is finally paid by the telephone user.

These taxes have been so cleverly incorporated into our general service charges by politically-minded lawmakers that the actual proportion of the customer's dollar that goes into tax coffers can hardly be determined by even the most expert of statisticians and accountants. From the facts that we have been able to gather, however, we can determine with reasonable accuracy that more than one dollar out of every three dollars paid for telephone service actually represents taxes that have been levied upon the several branches and divisions that go to make up and to serve the telephone industry.

Perhaps the enormity of this tax burden can best be realized by imagining it as a 50 per cent retail sales tax assessed against telephone users.

Someone may raise a question with regard to the propriety of including the taxes paid by our sources of supply, when we are showing the manner in which our service charges have been loaded with invisible taxes. Frankly, not being fools, we know very well that we pay all of the costs connected with the mining, lumbering, production, fabrication and delivery of everything that we use or consume in the telephone business.

No giant intellect is required to understand that these taxes are accumulated step by step, and are passed on to us, buried in every incoming invoice.

These taxes upon affiliates are very real, and they constitute a major element in the present-day cost of a residence or business telephone. They are so real that could all of them be wiped out, all the way back to the mine and the forest, some of our companies could approximate the rental charges they had on file 30 years or more ago. And they could do so without impairment of plant or injustice to owners.

It is a fact, easily proven, that the increased cost of telephone service today, as compared with costs three decades and more ago, is due more largely to constantly-increasing taxation than to any other cause.

It has become perfectly obvious that our operating telephone companies, as the final link in the chain by which all of these taxes are passed on, must undertake local campaigns of education. They must see that officials and lawmakers from their own areas, do everything possible to estop the levying of new taxes upon an industry that has been plundered to the point where both the efficiency and continuity of telephone service are in real danger.

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COMING CONVENTIONS

Minnesota Telephone Association, Radisson Hotel, Minneapolis, January 28, 29 and 30.

Nebraska Telephone Association, Hotel Clarke, Hastings, February 12 and 13.

Iowa Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 7, 8 and 9.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, April 22 and 23.

Indiana Telephone Association, Claypool Hotel, Indianapolis, April 29 and 30.

Additional Facilities South Africa to England

As a consequence of the popularity of the radio telephone service between South Africa and Great Britain, the existing facilities in South Africa are to be increased by the provision of a new high-power short-wave telephone transmitter, which will be installed at Klipheuvol.

The receiving station at Milnerton will also be enlarged to cope with the new traffic, and the new "international" type of Marconi receiving equipment, with invertor gear for secrecy of communication is being added to the installations already in use.

VALUES IN COMPETITION

A DIGEST OF DISCUSSIONS of a number of Independent telephone executives concerning points in address of Paul A. Walker, Chairman of the Telephone Division of the Federal Communications Commission, on "The Telephone Industry and the Public" at recent annual convention of the United States Independent Telephone Association held in Chicago

WHEN GOVERNMENT, either for economic causes or because of political pressures, reaches out to extend its control over a great industry, there is certain to be uneasiness. However commendable the purposes behind such a move, the possibility always exists that its actual administrators will lack the breadth of view and soundness of understanding necessary to carry those original purposes into practical effect. Where this lack appears, evils, instead of contemplated benefits, will inevitably result.

Of late months the telephone industry has lived in the shadow of just such apprehension. Recent legislative steps toward stronger federal regulation, however wisely framed, left wide open the vital question of how intelligently they would be administered.

Under such conditions the address of Paul A. Walker, chairman of the telephone division of the Federal Communications Commission, delivered before the annual convention of the United States Independent Telephone Association in Chicago last month, naturally became the focus of intense interest. His address proved of a quality to justify the interest.

Further and close study, which his remarks amply deserve, should go far toward moderating the apprehensions of the industry regarding the spirit in which the control legislation is to be administered by Commissioner Walker and his associates. The whole tenor of his comments bespeaks a broad understanding and statesmanlike approach to the basic problems involved.

In his opening remarks Mr. Walker paid tribute to the brilliant pioneering which brought the infant telephone art so swiftly to its present national stature. In so doing he was speaking, in fact, of the life work of the very men he was addressing.

Similarly, Mr. Walker could scarcely have found an audience more sympathetic to the ideal of public service that he enunciated. The leaders and leadership of the Independent telephone associations have for years been active in fostering just such an ideal. They have steadily guided and educated the industry's managers and employes toward it throughout the period of growth.

They know, too, from carrying its actual weight, the responsibility and trusteeship of which Judge Brandeis spoke—the necessity of striking a balance between a moderate charge to the public for the service rendered, and a reasonable return to the investor who has placed and risked his savings in the public service.

They have proven their skill and good management in striking this balance. The acknowledged economy of telephone service to its users in this country, and the marked stability of return to investors in telephone securities to date, bears ample witness to their trusteeship. But this balance and stability must not be secured in a way which sacrifices technical progress in the industry.

The speaker very properly went on to point out the important inventions and innovations which telephony owes to independent and obscure experimenters. In emphasizing this, he touched a factor which is vital to any technological advance but which is too often overlooked or minimized.

MANY people are persuaded that inventions and improvements today take place only in the highly-organized and systematized research laboratories. They imagine that innovation has become a great cooperative science in which no place is left for the solitary thinker and worker. In fact, the contrary is true, and probably will remain so.

Basic inventions—the radical new ideas—come from individuals, not organizations. Often they come not merely from outside the laboratories, but from free inventors, entirely outside of the industry which their idea will benefit. Laboratories excel, not at invention, but at refining the inventions of others and extending and perfecting their practical application.

Hence the importance of seeing to it that free competition* is preserved; competition not only of free inventors to produce innovations, but competition equally of manufacturers and operating units in the industry, eager to secure and apply new and better ideas which they can translate into ever better service at lower cost to the public.

If competition in an industry disappears, invention and improvement shortly die also. The stimulus to invention is destroyed. Any true monopoly ceases to progress because it feels secure in its position.

Under free competition every basic improvement is a challenge, and a threat to the organization that fails to take advantage of it. Under monopoly there is no challenge, for monopoly likes to assume that perfection has already been achieved. There is no threat, for there is no one else in a position to take advantage of new ideas. Naturally, therefore, the flow of improvement stops.

Possibly some day a means will be found to so regulate a monopoly that it will remain progressive. Thus far no such formula has been hit upon. Consequently all who have at heart the future of the communications industry must add a hearty "Amen" when Mr. Walker observes: "No system of regulation can ever supply the incentive of development and improvement which can be furnished by healthy competition through the Independent telephone plants and the Independent manufacturers of telephone equipment."

THE CONTRIBUTION of the Independents has not been limited to the discovery and introduction of new and better technical apparatus. Their ingenuity on the commercial and operating side has been just as noteworthy.

No one who studies the industry

*Competition, as used here, refers to competition between different telephone exchange areas, not competition within a single area.

can fail to remark, as Mr. Walker does, the really extraordinary way in which these Independent units, operating in thinly-populated, less prosperous sections, have held their own against their bigger brother, the Bell System, operating in the main in larger centers and more prosperous areas adjoining theirs. Their relatively meager resources they have supplemented by endless ingenuity so that the communication needs of their subscribers might be adequately met, even on the scanty revenues the latter could afford to pay.

By this resourcefulness at adapting existing plant to meet increasing demands and devising operating economies in order to stretch their subscribers' dollar over a bigger and bigger dollar's-worth of communication value, they have succeeded in providing a quality of service frequently not a whit inferior to that enjoyed by subscribers in the wealthier Bell areas adjoining them.

With them necessity has truly been the mother of invention. Their very poverty nourished expedients which not only met existing standards but in many cases permitted the entire industry to set new and better standards for itself.

This is the operating phase of that healthy competition on the part of the Independents which Mr. Walker cites as having aided the development of the entire art.

CONSIDERATION of these benefits, contributed to date by competition from Independent groups, throws into clear relief the dangers involved in any proposal to merge and centralize the entire industry under one ownership.

History repeatedly shows that wherever this step is taken, the next and inevitable step is government ownership. It never fails to happen, nor is it difficult to see why. When any private entity is permitted to own and control the entire supply of one of the nation's necessities—whether it be goods or services—the concentration of power is too great to be wise, or to exist for long without abuse.

Invariably the advocates of such a step for an industry are most persuasive in urging its advantages in terms of uniformity and simplicity, both of structure and operation. Invariably also they urge that proper regulation will take the place of competition and prevent the dangers inherent in monopoly from actually materializing. But however convincing these arguments in theory, the final fact always refutes them.

REGULATION, as a substitute for competition, quickly displays its weakness. If laxly administered, monopoly takes advantage of its position at the expense of the public. If, on the other hand, regulation takes too severe and too rigid a form, growth and progress are stifled, the structure of the industry becomes atrophied and weakened.

In either event, whether the result is excessive power or excessive weakness, the final outcome invariably is to force government to take over ownership of what it has proved itself unable to control effectively. The state-owned monopolies now common in Europe furnish almost endless examples of how this sequence of events runs its course.

Whether we like it or not, a review of the history of monopolies shows that this chain of cause and effect, once started, forges itself link by link to its conclusion, inexorably and always. Any country, therefore, whose tradition is opposed to government ownership will do well not to forge the first link in such a chain.

BUT IF GOVERNMENT regulation fails when relied on as a *substitute* for competition, its uses as an *adjunct* to competition are quite a different matter. So used, intelligent regulation can aid greatly in achieving a salutary stability among the competing units in the industry—a stability which benefits alike investor, subscriber, and the general public.

Leaders of the Independent telephone groups realize this value inherent in sound regulation. Consequently, they have from the beginning supported the Federal Communications Commission. Their whole attitude has been and is one of open-mindedness rather than hostility or opposition.

But, aside from any question they may at first have had as to the calibre of those who should be appointed to administrative duties, they have been naturally troubled by the possibility of conflict between state and federal regulation.

THE COMPLEXITY of the national communications web, whose units lie within states but whose activities transcend state boundaries, makes for confusion and overlapping of state and federal jurisdictions. Many of the points at issue are shrouded at the moment in a legal twilight that cannot be quickly resolved.

The awkwardness of divided and contradictory controls, added to the normal problems of running a complex industry, cannot but cause apprehension on the part of its leaders. Fortunately, as Commissioner Walker pointed out, recent rulings of the Federal Communications Commission have already clarified some of the uncertainties and confusions.

It is to be hoped that in due course all opportunity of fresh conflict will be removed. Whether this reconcilement will be brought about eventually by fitting the state commissions, in some proper and useful way, within the integrated controls of the Federal body, or alternatively by their ultimate disappearance, only the future course of events can reveal.

In the meantime the telephone industry, and indeed the entire country to which it renders so vital and indispensable a service, has good ground for satisfaction that administration of the new measures is placed in hands which appear conscientious and competent.

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Answers to Traffic Questions on Page 12

1. You may hold the circuit beyond the time allowance if the supervisor authorizes you to do so. The supervisor will allow the operator to hold the circuit beyond the time allowance if she believes that this will hasten the completion of the call and will eventually save circuit time.
2. These reports are not chargeable.
3. If, after you have asked for a line, the parties talking refuse to release it, no further action can be taken. Under no circumstances should you disconnect the parties talking on the line.
4. Three minutes.
5. The answer will be found in the introduction to these questions.

Sets Goal of 500 New Stations for December

After piling up a station gain of 233 for the month of September, the Western Telephone Corp. of Kansas has set a goal of 500 new subscribers' stations to be attained by December 20.

Plant Men Get Together

Lizards, a New Cause of Telephone Trouble

In Honolulu, Hawaii, a solution has been found for an unusual source of trouble and vexation for the service department of a telephone company. Small lizards, about three inches in length, enter the pole terminals of the Mutual Telephone Co., of that city, and lay their eggs there. Eventually the young lizards find their way across the carbons of the protected terminals. Until recently when steps were taken for the prevention of this trouble, the lizards were electrocuted by the jolt given by the current when the automatic dial was operated, causing a dead ground on the line.

F. G. Hummel, manager of the Mutual Telephone Co., recently mailed to the Cook Electric Co., of Chicago, Ill., several life-size photographs of this reptile, in addition to the corpse of one of these little animals who met his untimely end by becoming overly inquisitive concerning telephone protective equipment.

One of the illustrations reproduced on this page shows a young lizard in the position in which he met his death and incidentally caused a ground on a telephone line.

Mr. Hummel's letter to the Cook Electric Co. is quoted, in part, as follows:

"These little lizards are entirely harmless, although they have a forbidding look. One finds them here on the screens or windows at night, hunting mosquitoes. They get into the pole terminals, lay eggs there and eventually find their way across the carbons and get electrocuted by the jolt given by the automatic dial. They almost always cause a dead ground on the line, something in their bodies lending to that effect.

We have not kept an exact record as to the number of daily cases but they are known to be numerous and, as yet, no effective way has been found to keep them clear of the approximately 2000 Cook S-6 terminals we have in the city.

Today the humidity stands at 80 degrees on wet and dry bulb hygrometers, and it is a pretty severe test for a telephone plant, if continued over any length of time. This, fortunately, is not the case, two or three days being almost the extreme limit of these humid periods.

We have very little trouble indeed with the S-C as now turned out.

The pictures and exhibits show just one more trouble that the telephone business is heir to besides taxation."

Mr. Hummel's comment that he is now experiencing very little trouble with the cable terminals is a reference to the steps taken by the Cook company to prevent the grounding of the protector blocks by the lizards. The remedy was simple: The celluloid dielectric between the protector blocks was made about 50 per cent wider, and bent to form a right angle.

When the celluloid dielectric is placed between the protector blocks, this extra width covers the entire edge of one block. If a lizard crosses the blocks when the dialing current is passing, he is thus "insulated" from one block, preventing a ground on the telephone line; incidentally his life is preserved. So "preventive maintenance" scores again.

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Cable Alarm Signal of Modern Gas-filled Cable

There she blows! What a thrill the crew of the old whaling boats received when that alarm was given. A different kind of a thrill stirs the workers in a telephone office when the cable alarm rings, writes August F. Wenzel, switchboard engineer of the Rochester (N. Y.) Telephone Corp., in an issue of The Rochester Engineer.

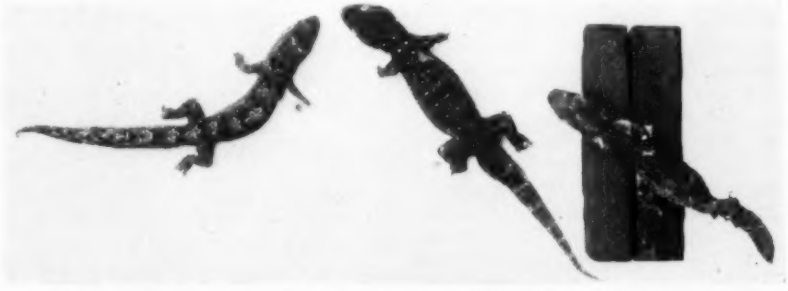
When the cable alarm signal rings a number of workers are affected: the wire chief's forces whose duty it is to test and maintain all inside equipment and wiring; the cable-test deskman, who has a record of the location of all the cables in the Rochester district; the cable crew who do the work of repairing cable troubles and the heavy duty crew who place the cables in the underground duct and string the aerial cables.

Due to the wires in the telephone cable being wrapped with paper it is very apparent that moisture is not welcome in these cables. There are a number of causes for a cable sheath break. In underground cables these causes occur most frequently: Construction work; street, sewer, building, gas and power work; electrolysis, chemical corrosion, breaks in placing cable, and poor solder work in wiping the sleeve joints over a splice. In aerial cable sheath breaks are caused by bullets, ring cuts and falling limbs.

With the cable plant such an important cog in the telephone machine, it was very quickly seen that the repair forces could do a quicker and better job if they could detect a break in the cable sheath before moisture entered the cable, and repair it. This would materially reduce the time a line would be out of service. With the present system of gas-filled cables, repairs are made without a single line being in trouble or "out of order" as subscribers are told by the operator.

We have been told that the fleas on a dog have other fleas; and so it is with alarm circuits in a telephone office, one of the larger offices having approximately 3,000 places where an alarm can start.

The first record we have where nitrogen gas was placed in a cable in this country dates back less than six years when it was used on the large aerial cable which most of you have seen entering and leaving Rochester by the way of Perinton and Buffalo Road. Each ten miles of this cable has an individual alarm circuit.



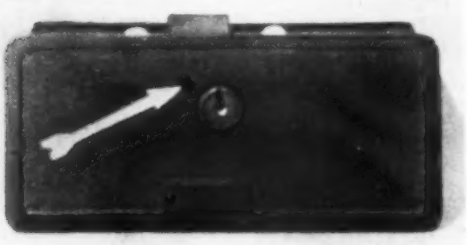
Small Lizards, About Three Inches Long, Have Caused Considerable Trouble to the Telephone Service in Honolulu, Hawaii, By Entering Protected Pole Terminals and Laying Eggs. When the Young Lizards Hatched, They Crossed the Carbons of Protected Terminals and Were Electrocuted When Dial was Operated, Causing a Dead Ground on Line. On the Extreme Right is Shown Actual Size of Young Lizard Which Met Death When He Attempted to Cross Protector Carbons.

The sleeve placed over the ordinary cable splice would not prevent air or gas from penetrating into the next section of cable, so it has been found necessary to make what is known as a plug splice.

A section of the cable sheath about three feet long is removed, a trough placed around the cable and the wires boiled in paraffin heated to a temperature of 325 degrees. The trough must be large enough to allow the paraffin to cool to 170 degrees in one hour's time. Quicker cooling causes cracks in the paraffin and the work would have to be done over. It is necessary to know the proper amount of paraffin to use for the different size cables.

When the proper temperature has

been reached, the trough is removed and a split sleeve placed over the cable and soldered. This sleeve has fastened to it, at each end, a one-quarter inch pipe flange. Asphalt compound is heated to 300 degrees and poured through a six-inch funnel into one of the pipe flanges. Care must be taken to see that there is always hot compound in the funnel to avoid air pockets in the plug splice. A three-quarter inch hole must be made in the cable sheath about one foot from the splice so that the air in the cable will remain at atmospheric pressure.



Arrow Points to Small Hole in Face Plate of Pay Station Coin Box Means of Which "Easy Money" Was Obtained by Someone.

The compound must be poured until bubbles no longer emerge from the other pipe flange.

After the plug splice has been completed, these holes will be soldered up. Schrader tank gauges are now placed by soldering them to the cable sheath at distances determined by the engineers, in some cases as far as a mile apart. Pressure contact gauges are also placed, sometimes three miles apart. Nitrogen gas at a pressure of 12 pounds per square inch at 60 degrees F. is now admitted at each Schrader valve. A ten-mile section of cable requires five tanks of gas and two days to reach an equal pressure throughout the cable.

The contact pressure gauge is now connected to the proper wires, the splices tested with soap suds, and we are ready for our first break in the cable sheath. If heat or other conditions cause a pressure gauge to register above 30 pounds some of the gas must be allowed to escape. When a break occurs and the alarm rings, which usually happens about ten hours after the break, a pressure test is made at all gauges and the result plotted on cross-section paper. Where the lines cross is the approximate location of the break which is located either by riding the cable messenger or with the help of soap suds.

When a break occurs in a cable manhole it will always be necessary to pump air into it before anyone is allowed to enter. In repairing a break in the cable under pressure it will be necessary to drill a couple of small holes either side of the repair sleeve so that a good job of soldering can be done. Moisture cannot enter a cable while gas is escaping. This gas escapes very slowly.

While passing a construction job one of the cable-repair forces had an idea that the workmen were very close to a very important cable. Upon investigation it was found that the cable had been injured and the break covered with cement by the workmen. Several hours after the repair had been completed the cable alarm in the central office rang, and the joke was on the wire chief's forces.

There is something new under the sun. The important trunk cables in our system between central offices are now equipped with this alarm system and the subscribers' cables to the homes will be so treated a little later.

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Pay Attention to Your Pay Stations

The white arrow visible in the accompanying illustration, sent in by J. F. Browne of the Columbia Telephone Co., Columbia, Pa., points to an innocent-looking hole about the size of a six-penny nail which has been drilled into the face plate of a pay station coin box.

When or where this hole was made in the box and its original purpose is something to be figured out, says Mr. Browne. Nevertheless, it was found to come in handy in supplying easy money to the party observing it and having the ingenuity to manipulate a wire and a small screw driver.

Telephone men are thus reminded that it pays to pay attention to pay stations, and particularly to the small irregular things which, if overlooked, may be "gravy" for crooks.

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Setting Poles in Michigan by the Blasting Method

Many obstacles confronted the outside plant department of the Michigan Bell Telephone Co. in the task of moving toll lines to a new right-of-way in order to make possible certain highway improvements along U. S. 41, north of Menominee, as described and illustrated in a recent issue of the Michigan Bell.

The early spring season added to the difficulties of setting poles in marsh lands, swamps and muck and quick-sand areas, at times covered with water waist deep. Sometimes it was also necessary to blast through solid rock.

Pole-setting equipment built by the construction forces of the Michigan Bell and known as a log-jammer in the northern logging country, was brought into use on this particular job. Sometimes it was hauled into place by means of horses, while at other times it was necessary to use complicated block, tackle and line arrangements, power being supplied through truck winches.

In most instances the poles were set by the blasting method. This consisted in first setting a pole into position in the muck, quicksand or water and placing a blasting charge under the pole, with a cushion of earth between the pole and the charge. The charge was then set off and a chamber thus opened in the ground below the pole. The pole thereupon settled into the hole thus created.

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Some Telephone Things I Didn't Know Until Now

By Oscar Will Tell

That porous vulcanized rubber is now successfully used for storage battery separators. The minute pores are 0.000016 inch in diameter with approximately 3,000,000,000 of them occupying every square inch.

That a private four-mile telephone line running to a Sacramento Valley ranch, uses second-hand boiler pipes for poles.

That Forest Service lines, due to the fact that they are usually on top of mountains, are bothered considerably by lightning. They are never used during storms and the lines are brought into instruments from the last pole through underground metal conduit. As a further precaution, the line is opened on the pole during a storm by a switch controlled from the cabin by a rope.

That a trouble-shooter in New Hampshire found a 19-inch pickerel tangled-up in a toll line 35 feet above the ground, as the cause of a case of trouble. The supposition is that a fish hawk or eagle dropped the fish when attacked by another bird.

That in telephoning from Seattle to New York, vacuum tubes of a number sufficient to operate about 25 high-grade eight-tube radio sets, are talked through.

That split porcelain tubes can now be obtained which are slipped on a wire and taped in place when such protection is required.

That there are nearly 20 telephones for each 100 people on the Pacific Coast, the highest percentage of any group of states in this country.

That ordinary wood shingles are ideal for leveling pieces of equipment, such as a multiple switchboard, on an uneven floor.

Iowa Fall District Meetings

Those in Attendance at the Oskaloosa, Iowa, District Meeting of the Iowa Independent Telephone Association.

LATE IN October several hundred operators and managers of telephone companies operating in southern Iowa derived pleasure and profit in attending district meetings sponsored by the Iowa Independent Telephone Association. The first meeting in the series was held at Marengo, on October 25; the second at Oskaloosa, on the 28th; the third at Centerville, on the 29th; and the last at Clarinda, on the 30th.

Foremost among the subjects discussed at the various meetings were the report of the Iowa State Planning Board, the problems of taxation, including those imposed by the Social Security Act, activities of the Rural Electrification Administration and reduced fire insurance rates for farms equipped with telephones.

Much interest was manifested in the last-mentioned subject. At the Centerville meeting an incident was related by A. J. Adams, of the Lucas County Telephone, Chariton, Iowa, in which the presence of a telephone in the farmhouse saved a man from being burned to death.

The farmer in question happened to be standing in the doorway of his barn when it was struck by a bolt of lightning. The bolt, which set fire to the barn, caused the farmer to become paralyzed temporarily. His wife was unable to move him from the burning barn—he weighed some 225 pounds—so she rushed to the house and called the nearest neighbor on the telephone. She was soon aided in removing her husband from the burning barn—but only a short time before it collapsed. The farmer later announced that the telephone would be a permanent part of his home equipment.

Charles C. Deering, of DesMoines, secretary-treasurer of the Iowa association, presided over the forum for managers at the various district meetings, while Miss Anne Barnes, of DesMoines, who is engaged in supervisory traffic work, conducted the traffic school for operators under the auspices of the Iowa State College of Ames.

Mr. Deering was assisted by C. E. Plamadore, of DesMoines, district manager of the Northwestern Bell Telephone Co.; H. C. Shear, of Waterloo, representative of the American Automatic Electric Sales Co., and John A. Campbell, Genoa, Ill., representative of the Leich Electric Co. In her work, Miss Barnes had the helpful cooperation of Miss Marie Hanney, of the Northwestern Bell Telephone Co., DesMoines.

The Northwestern Bell Telephone Co. was host to the district conference at Oskaloosa, attended by some 38 delegates. At noon a delightful luncheon was served, at which the entertainment included numbers by high school music groups.

C. A. Farrington, president of the Iowa association and owner-manager of the Appanoose County Telephone Co., of Centerville, was the genial host at the fine district meeting held in his community. All of the arrangements, including the menu for the luncheon at the Chamber of Commerce, indicated great care in preparation for the profit and pleasure of those attending the meeting.

Musical numbers at the luncheon included vocal solos by Norman Stromdahl, accompanied by Mrs. Davis. A humorous reading by Miss Shirley Elledge and an amusing skit on salesmanship by Mrs. Opal Buscemi and Miss Helen Murphy were also very much enjoyed.

The general program included a thoughtful address on the Constitution by T. G. Fee.

A. L. Kelley, manager of the Farmers Mutual Telephone Co., of Clarinda, served as host at the meeting in his community. The program for the Clarinda meeting included talks by Homer Stephens, local attorney; C. C. Caswell, editor of the Clarinda Herald-Journal; Clover Bond, traffic supervisor and Miss Mary Kearre.

Entertainment at the luncheon was furnished by the junior college quartette and by Miss Eloise Wilcox, vocal soloist, accompanied by Miss Aleatha Hutchings. The afternoon session was enlivened by a skit entitled "Sales Activities," presented by Creston operators.

Those Who Attended the Marengo District Meeting, on October 25, in This Series of Fall Meetings Sponsored by the Iowa Independent Telephone Association.

President C. A. Farrington of the Iowa Association Was the Host at the Centerville District Meeting Attended by This Group of Telephone Folks.

North Carolina Holds Fourth Annual Convention

"A VERY FINE" convention was held by the North Carolina Independent Telephone Association at Sedgefield Inn, N. C., on November 4 and 5. Sedgefield Inn, at which this fourth annual gathering of the association took place—a beautiful winter resort in the picturesque Piedmont section of North Carolina with a splendid golf course, tennis courts, and many other attractions—is located about seven miles west of Greensboro, N. C.

At the opening session, Monday morning, November 4, President Robbins Tilden, who is also assistant secretary of the North State Telephone Co., High Point, N. C., made a splendid talk in which he presented an account of the activities of the association during the past year and outlined various problems which must be met in the forthcoming year.

W. C. Darrow, vice-president of the Carolina Telephone & Telegraph Co., of Tarboro, N. C., presented his report as secretary-treasurer, reflecting that the financial condition of the association is satisfactory.

Reports were also made at this session by J. R. Porter, executive vice-president of the Carolina Telephone & Telegraph Co., of his work as chairman of the legislative and tax committee; by E. W. Olschner, chairman of the rural electrification committee; and by J. T. Sadler, chairman of the auditing committee.

F. B. MacKinnon, of Chicago, president of the United States Independent Telephone Association, presented a most interesting address in which he discussed rural electrification and problems arising from the enactment of the Social Security Act and orders of the Federal Communications Commission.

After an open forum discussion on such problems as accounting, taxes, depreciation, traffic, public relations, etc., the morning session was declared adjourned.

The Tuesday morning session was opened with the presentation of a splendid talk on a "Safety Program for Telephone Companies" by Harry McMullan, chairman of North Carolina Industrial Commission. Mr. McMullan strongly recommended a very definite safety program for all telephone companies, no matter how small they may be.

Dr. H. A. Affel of the Bell Laboratories, New York City, then gave a most interesting and instructive talk on "High Frequency Broad Band Systems." His remarks were illustrated by lantern slides and a number of exhibits of newly-developed toll cables.

A. L. Geiger, of Washington, D. C., general counsel of the United States Independent Telephone Association, made a very comprehensive talk concerning the recently-enacted Social Security Act.

W. C. DARROW, Secretary - Treasurer of the North Carolina Association, Is Vice-President of the Carolina Telephone & Telegraph Co., With Headquarters at Tarboro.

The annual banquet of the North Carolina association, which took place at 7 p. m., Tuesday night, November 5, was most successful and enjoyable. In addition to a splendid orchestra, the convention delegates were entertained by a group of negro singers and by a fine dancing team.

L. D. Densmore presided at the banquet in his usual affable and inimitable way. Short talks were made by Charles H. Robertson, collector of U. S. Internal Revenue for North Carolina; E. M. Knox, city manager, High Point, N. C.; Andrew Joyner, city manager, Greensboro, N. C.; Lewis E. Teague, special court judge, High Point, N. C.; T. J. Gold, attorney, High Point, N. C.; F. B. MacKinnon, of Chicago; and J. N. Cox, president of the Tennessee Independent Telephone Association, Cookeville, Tenn.

After the banquet had been served, many of those attending the convention enjoyed dancing until late hours.

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Chester I. Barnard President of Pioneers

Chester I. Barnard, president of the New Jersey Bell Telephone Co., was elected president of the Telephone Pioneers of America at the 14th annual meeting of the organization's general assembly, held recently in Cincinnati, Ohio. James E. Macpherson, senior vice-president of the Bell Telephone Co. of Canada, was elected senior vice-president.

The other vice-presidents elected were: Aubrey H. Mellinger, vice-president in charge of operation, Illinois Bell Telephone Co.; John T. Harris, vice-president and general manager, central area, Bell Telephone Co. of Pennsylvania; Miss Anna L. Pickle, division traffic employment supervisor, Pacific Telephone & Telegraph Co.; Edwin T. Mahood, engineer for the Western Missouri & Kansas area, Southwestern Bell Telephone Co., and Miss Carrie Schorner, chief operator, New Rochelle central office, New York Telephone Co.

The members of the executive committee elected to serve during 1936 and 1937 are: Edward V. Cox, assistant vice-president, A. T. & T. Co., and George L. Kelley, assistant general supervisor of central office equipment installation, New England Telephone & Telegraph Co.

Members of the executive committee holding over from 1935 to the end of 1936 are: E. F. Carter, vice-president, A. T. & T. Co.; J. A. Remon, general manager of the Chesapeake & Potomac Telephone Co., and C. G. Stoll, vice-president of the Western Electric Co.

In his address to the assembly, President-elect Barnard laid stress on the meaning of the Pioneer organization. While originally composed of telephone people who were literally "pioneers" of the industry, today, and as time goes on, the membership is becoming what might better be termed the "old guard"—composed of telephone men and women whose high character has been proven through 21 years or more in the service, who have earned the right to be known as Pioneers.

Prize-Winning Float Entered in Farm Shows in Lancaster County, Pennsylvania, This Fall by Denver Ephrata Telephone & Telegraph Co. The Young Women Shown on the Float Are Operators of the Company and Are (Left to Right): Anna Kauffman, Mary Hornberger, Fern Furlow, and Bertha M. Brossman (Seated Back of Honor Cup) Who Supervised the Decorating of the Float by the Company's Office Force.

Here and There in the Field

Pennsylvania Company Finds 'It Pays to Advertise'

There are many telephone companies, in the United States which make no attempt to advertise their service, partly through lack of funds and partly because the managers or owners are "diehards" who think people will install a telephone only if they want it and come to the exchange to order it. Other wide-awake telephone companies seize every opportunity to contact their subscribers and to point out the incomparable value of the telephone, particularly in times of accident, serious illness and fire.

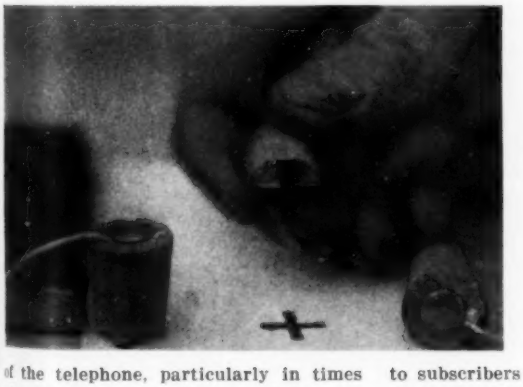
Farm shows given in Lancaster County, Pennsylvania, this fall furnished an excellent opportunity to the Denver & Ephrata Telephone & Telegraph Co., of Ephrata, Pa., to enter a beautifully-decorated float which attracted attention and later carried off prize-winning honors.

In addition to entering the float, the company arranged a telephone exhibit at its Ephrata exchange, consisting of relics of telephone equipment, old and modern telephones, and other equipment.

In conjunction with the telephone exhibit, the Denver & Ephrata company showed moving pictures in the rear of the Ephrata exchange, which were witnessed by one thousand people. At the same time telephone literature was given out and pencils presented the guests as souvenirs. The moving pictures were silent films, some of which were taken in the company's territory with its own camera. Notices were sent to subscribers with their bills, inviting them to visit the exhibit and see the moving pictures.

The prize-winning float consisted of a frame built over one of the company's installation cars. The decorating was in charge of the office force, supervised by Miss Bertha M. Brossman, who is seated in back of the honor cup on the front of the float, shown in the accompanying illustration. The large bell and telephone, which is six feet high, will be loaned by the telephone company to local merchants for window displays and to encourage sales by telephone.

C. E. Eaby, manager of the Denver & Ephrata company, stated that the telephone exhibit created a lot of interest and helped the company's sales work. "We are having the largest gain in telephones this year since 1929," he said.



Handy Markers Easily Carved Out of Cork for Use in Voting.

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Flashes and Plugs— News Briefs and Comments

October reports showed that 16 of the 24 Bell System operating companies are more than earning their dividends.

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Telephone subscribers in England whose eyesight is weak can have their telephones equipped with dials having figures three times the normal size.

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Dr. C. B. Jolliffe, chief engineer of the Federal Communications Commission and prior to that chief engineer of the Federal Radio Commission, has resigned. He is now technical head of the Radio Corp. of America, with supervision over allocation matters.

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Useful Ideas: Handy Marking Device

Voting is a thing commonly done by a considerable body or assembly of people on prepared forms when it is not the usual procedure of governmental elective functions either. There always seems to be a shortage of pencils on such an occasion, and most of them are

(*Concluded on page* 28)

IT SAVES TIME, miles, disappointments. You *know* when friends are home, when relatives who are traveling are late, whether tickets for tomorrow's Big Game will be waiting when you get there. *Telephone first.*

TELEPHONING out of town costs little during the day. After 7 P. M. it's about 40% *less* for most 3-minute, station-to-station calls. Then you can talk about 75 miles for 35c; about 150 miles for 50c.

Spreading The TOLL HABIT

• Many people who use local service freely have not discovered the telephone's helpfulness in running their more distant errands. To make toll telephoning an instinctive habit is one of the prime functions of Residence Toll advertising.

• The advertisement on the opposite page, which appears in national magazines during November, suggests occasions when the telephone saves miles and minutes, emphasizes the low cost of calling, and brings home the idea, "Always TELEPHONE FIRST."

• The entire telephone industry should share in the traffic stimulated by this type of advertising.

(*Concluded from page* 25.)

habitually placed in pockets before the routine is finished. Pencil marks, too, are often none too easy to read and count on the paper used in many instances for ballot purposes.

The illustration on page 25 shows the practical and novel manner in which a number of handy markers were quickly made for use by a group of employes voting on a quota of officials. A number of small, smooth corks were procured. A cross was lightly marked with pencil on the smaller end. The excess cork was neatly and quickly removed with the corner and point of an old safety rabor blade, leaving a perfectly square "X" or cross.

When pressed to a stamp pad and then to the paper, a large distinct legible mark was instantly impressed. A thumb tack and a short piece of string fastened it securely to the stamp pad box. The cross can be neatly trimmed to size.

"CHIKK" CROW ARTIST
NOTHING IMPOSSIBLE — WITH US IN — ADVERTISING.
"ZIP" TELEPHONE GROUND ROD DRIVES RODS WITHOUT EFFORT
BEACON D. SCHROOCH, "ZIP" MANAGER AND PHYSICAL ENGINEER FOR THE GUMVILLE TEL & TEL
"ZIP" ADV. CO.
COR. HUMP & CO AVE.
ARMCHAIR, OZARKIANA.
TELEPHONE POLE ADVERTISING OUR SPECIALITY

Armchair, Ozarkiana.
November 12, 1935.

Telephony Publishing Corp.
Chicago, Ill.

Dear Mr. Telephony:

My mother, Mrs. Emily Schrooch, ast me to write you on my new letter head which you should see directly above and to thank you for publishing the portrait of my new patent ground rod rammer a spell or two back. This machine was on exhibit at the Ox Grove Telephone Convention.

I haven't yet quite decided about taking up telephone work as my life's calling as there seems to be a lot less hard work in the advertising field. It's no trouble to sell advertising but my one big effort is to get it painted on time. I've got a crackin' good artist but he's so plegged slow that it just gives me the 27-year itch to have to watch him when he starts to get into action.

He spends half of his time huntin' around for the makin's of a cigarette and the other half reconoiteren for a match to light on it. I'm sure glad I don't smoke for it saves a lot of my valuable working time by not doing so. I think this smoking to get a "lift," like they advertise in the big journals, ought to be the kind of a lift which will help them out the front door on the toe of your boot. I didn't mean the advertiser, of course, but you know who I do mean.

Cigarettes may be all right but, lemme tell you, I prefer to get *my* breath without anybody telling me how to do it. I am sorry I said that, because I don't believe in knocking the other fellow's business, but it's done said so just forget it.

Mrs. Schrooch, my mother, who is purchasing agent for all the businesses housed here in our exchange building, ordered the material today for the Rubberton toll line which we are building shortly if time and space permits. Some days the advertising takes all of my time and the old man (I mean my father, Mr. Schrooch) is expecting me to do the tellafone engineering and construction work now since he has gone in for political honor and achievments.

The first engineering I will do perhaps will be to excavate a hole to put the poles in. Getting rightaway, trimming trees and sighting the line is just minor details as compared to this. The big item in this country, when you start to build a line, is to get the sockets deep enough to plant the cedars in, as our earth is full of misselaneous sized rocks down here.

It sometimes takes a whole day to spoon out a hole deep enough to erect a 25-footer with a six-inch butt. Dynamite is entirely too scarce to be useful so you just have to content yourself with slicking off the pieces and lifting them out of the bottom of the hole with your fingers.

Mother is counting on you coming down when we get our office residence remodeled. I am drafting the plans now and if you can come at once it will help me lay out the office, fone renewaling and battery departments a lot better. Our howler room will no doubt have to go in the basement. For fear some of your constituants do not know just what a howler is, I will here say that it is a device to connect up to a party line when you want "rubbernecks" to hang up for awhile till you get through ringing for a party you want on that line.

We have a good strong howler and it's very necessary in our case. Old Grampaw Louper on line 12 rubbers most of his waking hours for fear something will go on in the neighborhood without him knowin' it, and being a little deff he is hard to get off the line. When we are howling on his line for clearance we usually have to screw the governor up to the last notch to fetch him.

Our howler was designed by myself and it is so strong that it will knock a crow off the line 8½ miles from the office. I'll make you a sketch of this in a few days and show you how it looks and works. TELEPHONY's readers will be glad to learn of this as most every exchange has a party line or two which needs boring out occasionally, and especially when some of the feminine genders appropriate all the talking space thereon.

When our office howler is howling we have to close all the doors and windows so the neighbors won't think that it is the city fire department taking off. We'll proberly make an underground tavern to house this very useful and necessary piece of office equipment.

You will perhaps remember that I am now working on our new manufacturers' catalog. If you want any special-shaped tellafone parts for your customers send in a sketch and we will try and make them. Headliners in the catalog will be the "ZIP" Ground Rod Rammer, galvanized tellafonic foto easels and my father's new sun motor which he is inventing. The model for this is about done and we will etch this and probably put it on the front cover, as the demand should be extremely large.

It is a little problematical what we should charge for the catalog. Possibly after the customers have absorbed all the research expense we'll put the price at a dollar down and a dollar a month for the rest of a natural life.

I scarcely know how to end this letter as I have so much I wanted to tell you and, since space is so limited, I am going to let you in on something that few people suspect—*I'm in love.* I'll send you her foto shortly.

Yours respectively,
ZIP ADVERTISING CO. Unincorp.
Per Beacon D. Schrooch, Manager.

Activities of Commissions and Courts

Work Order Systems and Other FCC Actions

The telephone division of the Federal Communications Commission on November 6 authorized Chairman Paul A. Walker to send the following letter to the state utility commissions:

The commission would like to have the benefit of reviewing the general rules, regulations, or orders issued by the commission of your state dealing with these subjects. Will you please supply copies of such of these items as may be available?

It will also be beneficial if we can obtain from you any recommendations in this respect, additional to those appearing in the recommendations made by the National Association of Railroad and Utilities Commissioners on October 31, 1934. It is desirable to have your recommendations and copies of your pertinent available publications by December 15, 1935.

An opportunity will be afforded all interested parties to review the draft of the aforementioned uniform regulations and to participate in conferences relating thereto before any formal action is taken by this commission.

The commission also denied the application of John W. Felton for authority to hold the position of officer or director in more than one carrier subject to the Communications Act of 1934. Mr. Felton is connected with the Western Light & Telephone Co.

The applications of Wilfred T. Brandon, I. D. Gindhart and Robert N. Moses, who filed applications to serve as officers or directors of more than one carrier subject to the Communications Act, were dismissed. This was done as they had withdrawn their original applications and no longer desired to hold positions with more than one carrier.

Lt. E. K. Jett on November 6 was designated acting chief engineer to succeed Dr. C. B. Jolliffe, who has resigned, effective November 12, 1935.

Lt. Jett has been identified with communications for 20 years, having served in the Navy 18 years and with the former Federal Radio Commission and the FCC for the past seven years. He has been serving as assistant chief engineer since September, 1931, having charge of radio services other than broadcasting. Since the creation of the FCC, wire telegraph services, including submarine cables, have been added to his duties.

W. J. Norfleet, who has been acting chief accountant since June 7, 1935, was named chief accountant of the commission. He will head the accounting, statistical and tariff department.

Mr. Norfleet went to the Federal Communications Commission from the bureau of valuation of the Interstate Commerce Commission, where he was employed many years.

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Decreases Book Value of Illinois Commercial

A $4,000,000 decrease in the book value of the Illinois Commercial Telephone Co. of Springfield, was fixed by the Illinois Commerce Commission in a hearing on November 8 on the utility's petition to be allowed to include the sales tax in its bills to subscribers. The property value set by H. W. Pike, auditor of the company, was $13,400,000. After cross-examination by Harry R. Booth, assistant counsel for the commission, the figure was altered.

Further cross-examination in the matter will be conducted before the commission November 20.

• • •

Unique Auction Over Long Distance

The heirs of a Kansas estate received $825 more than they otherwise would through the liquidation of the property involved as a result of a $3.80 long distance call. Judge Frank Kissinger, of Mankato, Kans., probate judge of Jewell county, with the cooperation of the United Telephone Co., conducted an auction by long distance telephone and thus substantially increased the price bid for a farm sold in order to settle an estate in his court.

J. H. Stauffer, Lawrence, Kans., had posted a bid for $4,150 before the closing date for the sale of the fine 160-acre farm in question. On the morning of the closing date, several of the heirs and the administrator of the estate, John Vance, assembled in the office of the probate judge. Ole Loveseth, of Randall, Kans., the only bidder present, raised Mr. Stauffer's bid to $4,175. Judge Kissinger thereupon put in a call for the Stauffer residence some 200 miles

ASK
YOUR LINEMEN

- Ask your linemen why they prefer to install BURGESS TWIN-SIX 3-Volt Telephone Batteries when they replace two old round No. 6's in rural phones. They'll remind you they make only two connections instead of four when replacing with the TWIN-SIX; they carry 40% less weight, 30% less bulk; and they give your subscribers a strong, even talking current.
- Save your linemen's time and your money by replacing with the BURGESS TWIN-SIX.
- Mail your TWIN-SIX orders to Inland Equipment Co. Price is 39¢ (47¢ west of Rockies), terms 5% 10 days, net 30. Shipment prepaid on orders of 30 or more.

BURGESS
TWIN-SIX
TELEPHONE BATTERY

INLAND EQUIPMENT CO., (Distributors)
MAX F. HOSEA, President, INDIANAPOLIS, IND.

A DEPENDABLE

Trouble Shooter

WESTON MODEL 689 CIRCUIT TESTER

Here's the instrument of broad utility, for trouble shooting . . . for checking switchboard circuits—checking continuity of the circuits — checking resistances — locating high resistance in splices—serving as a miniature wire-chief's voltmeter — and many other profitable uses. Its two ranges of 0-5,000 ohms and 0-50,000 ohms serve for practically all low and high resistance measurements. And it's Weston built . . . the best guarantee of dependability in any instrument for telephone service. Bulletin describing Model 689 and all other instruments available . . . Weston Electrical Instrument Corporation, 576 Frelinghuysen Avenue, Newark, N. J.

WESTON *Instruments*

distant. With the speedy cooperation of the telephone company the call was put through in a few minutes.

The judge explained the situation to Mr. Stauffer's daughter and turned the telephone over to Administrator Vance who accepted the subsequent bids of Messrs. Stauffer and Loveseth. When the time came for closing the bidding, the court accepted Mr. Stauffer's bid of $5,000 for the purchase of the farm, $825 more than the farm would have brought without the cooperation of the long distance telephone. This amount was said to have been more than sufficient to pay the costs of administering an estate that had been in the court for four years.

• • •

State's Estimate on Conduit Costs Questioned

As hearings continued before the Wisconsin Public Service Commission on November 7 in the rate inquiry of the Wisconsin Telephone Co., counsel for the company questioned accuracy of a $3,000,000-valuation of its Milwaukee underground conduit system.

The valuation was cited by Frank C. Thiessen, commission engineer, in rebuttal testimony contrasting with the $5,631,050 valuation of the same property by George F. Crowell, company engineer.

Mr. Thiessen claimed that inexperienced Milwaukee relief workers dug ditches twice as fast as the rate assumed by company engineers in valuing its property for telephone rate-making purposes.

Frederic Sammond, company counsel, charged that Mr. Thiessen's appraisals were based largely on his own experience with gas and water structures, whereas telephone conduit requires more careful workmanship and is more costly.

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Cross-Examination in Southern Bell Case

Cross-examination of witnesses for the Southern Bell Telephone & Telegraph Co.—in its appeal from rate reductions ordered by the North Carolina Public Utilities Commission last December—went forward briskly in Wake County Superior Court, Raleigh, N. C., on November 5. The de novo hearing is being held before Judge G. Vernon Cowper, of Kinston, who will determine the issues of fact and law involved in the case.

The witnesses who gave direct testimony at the session on Monday, November 4, were L. W. Hill, of Atlanta, costs engineer for the telephone company; and W. P. Brooks, of Atlanta, the company's traffic manager.

Mr. Hill devoted most of his time to an explanation of methods he used in reaching a value for the company's North Carolina properties. Mr. Brooks' testimony centered about his computations of the comparative density of intrastate and interstate traffic on telephone and telegraph lines.

OHIO BELL SEEKS TO ENFORCE "STANDARD TOLL PRACTICES"

A CASE which has aroused much interest in Ohio telephone circles and one that involves a situation of much importance to Independent operating companies of that state now awaits the decision of the Ohio Public Utilities Commission. It is that in which the Ohio Bell Telephone Co. filed a complaint with the commission alleging that the Northern Ohio Telephone Co., of Bellevue, had refused to adhere to standard practices laid down by the complainant in the handling of long distance service.

The case, which at first was viewed as just an ordinary service complaint but is now believed among Independent operators as an attempt on the part of the Ohio Bell Telephone Co. to secure domination of the industry in Ohio, came up for a hearing before the commission on November 1. After a day spent in hearing certain phases of the case, including the answer of the defendant company, which admitted that it was dependent upon the Ohio Bell for long distance service, but had adopted a system of its own in the matter of handling long distance service, the commission recessed the hearing until November 6.

The answer of the Northern Ohio Telephone Co. also sets forth that of 897 central offices in the state the Ohio Bell company owns 217, while the remaining 680 offices are operated by Independent interests.

The Northern Ohio company, in its answer, declared that the standard practices, which the plaintiff insisted upon it adopting, were not essential to good service, and that the system that it was using had proven very satisfactory. Further it was charged that the "fundamental toll plan" of the Ohio Bell company was invalid because it never had been approved by the commission.

O. N. Olsen, district commercial manager of the Bell in the Columbus territory, admitted this charge on the stand.

A. L. Kelley, Manager of the Farmers Mutual Telephone Co., of Clarinda, Saw to It That This Group of Telephone Managers and Operators Had an Enjoyable as Well as Profitable Time at the District Meeting Held in His Community on October 30 by the Iowa Independent Telephone Association. (See Page 23 of This Issue.)

but said that such approval was not necessary. He contended that the Ohio Bell plan provides for the reduction of "toll centers" which term is applied to switching stations for several small exchanges, to a maximum of 40 by 1944. The plan, he said, would result in faster and more efficient service to customers.

Exhibits presented by the Ohio Bell company showed that the number of "toll centers" had been reduced from 205 to 100 since 1924 when the plan was put into effect.

Frank L. McKinney, secretary-treasurer of the Ohio Independent Telephone Association, in discussing this phase of the evidence presented to the commission, said:

"If the number of such switching stations were reduced, the result would mean much less revenue for the Independent companies, because they would be required to depend upon wires of the larger company more than before."

"Ohio Independents," he continued, "have more than $60,000,000 invested in local and long distance telephone plants. They are free of Bell ownership and control, and are equally entitled with the Bell System to decide how they shall route their local and long distance business so as to serve their subscribers and owners to the best advantage."

The opinion prevails in certain quarters that the Independent telephone interests of the state will not rest on any adverse decision by the commission in the case at hand, and that the questions at issue will probably be carried through the courts in the event that the Ohio Bell complaint is sustained.

It was clearly brought out during the hearing before the commission that Independent companies in the state are not consulted on any changes in "standard practices," and this was admitted on the stand by Eugene W. Lormer, general traffic engineer for the Ohio Bell company. He further admitted that the Northern Ohio Telephone Co. is not the only Independent organization in the state that has refused to observe the "standard" practices now in dispute but that the same course had been followed by the Independent exchanges at Circleville, Lebanon, Logan and St. Marys.

• • •

Railroad and Utilities Organization Reorganizes

The reorganization of the Southeastern Association of Railroad & Utilities Commissioners, defunct for several years, was perfected on October 17 at a meeting in the Hermitage Hotel, Nashville, Tenn., attended by commissioners of nine southern states.

Porter Dunlap, member of the Tennessee Railroad & Public Utilities Commission, was elected chairman of the association. R. C. Self, chief clerk of the North Carolina Utilities Commission, was elected secretary.

Members of the commissions of Alabama, Georgia, Florida, North Carolina and Mississippi will be members of the Southeastern association. Only Mississippi was not represented at the meeting.

• • •

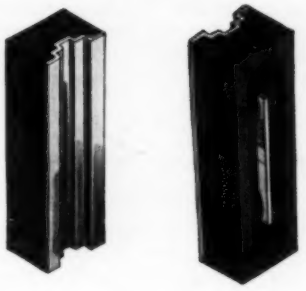
Approves Closing Unprofitable Exchange

The South Dakota Railroad Commission, on November 5, granted permission to C. L. Clendenning for permission to abandon the exchange operated at Esmond, S. D., under the name of the Esmond Telephone Co.

The application set forth that but two subscribers, one town and one rural, are now paying rental and that six service stations now being switched at Esmond are also connected with the Iroquois exchange, so that they will not be deprived of switching service by the closing of the Esmond exchange.

Examination of the company's records

COOK



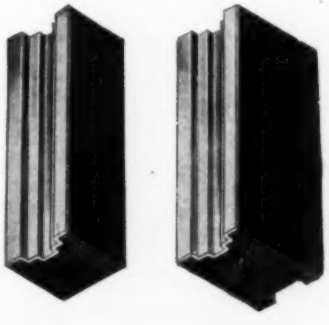
During its twenty years of manufacturing lightning protection for telephone and signal systems, Cook has had some exceedingly interesting problems to work out. Not only protection from high potential discharges, but also from insects, and particularly the combination of dust and moisture.

Maintaining a clear, clean, insulated space of only .005 inches between carbon blocks, one line and one ground, is under some conditions, exceedingly difficult.

Cook True Gap Discharger is made of a moulded bakelite block the size of an ordinary carbon. This high-grade insulation surrounds the discharger and eliminates any danger of breakdown over the outer surfaces of the True Gap discharger block to the grounded carbon block. It is safe against insects, dust and moisture.

That means to you, Mr. Telephone Man, adequate protection with a minimum of attention.

Samples on request.



Cook Electric Co.
2700 Southport Ave.
CHICAGO

show that for the year 1934 the company had but two business telephones paying a monthly rental of $1.25 each and three party-line subscribers. The toll commissions for the year amounted to $62.78, while the deficit for the year was $299.28.

The commission thereupon concluded that it is apparently impossible for the company to continue its operation and authorized the discontinuance of service, as requested.

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Rates Allowed for Additional Service

The Stanton Telephone Co. has been authorized by the Nebraska State Railway Commission to publish and enforce the following rates for common battery service to its city subscribers to the Stanton exchange:

	Gross	Net
Business, private line:		
Wall set	$3.25	$3.00
Desk set	3.40	3.15
Handset	3.60	3.35
Party business (harmonic ringing):		
Wall set	2.90	2.65
Desk set	3.05	2.80
Handset	3.25	3.00
Individual line, residence:		
Wall set	2.25	2.00
Desk set	2.40	2.15
Handset	2.60	2.35
Party, residence (harmonic ring:		
Wall set	2.00	1.75
Desk set	2.15	1.90
Handset	2.35	2.10

It was further ordered that such rates shall not take the place of any present rates but shall be in addition thereto for additional service that is offered, and that such rates shall be subject to the present gross and net rate rule in force at the Stanton exchange of the company.

The company recently purchased and installed a new, full-feature Stromberg-Carlson common battery switchboard in its central office and made other improvements that bring that office equipment up to a high standard with the intention of offering common battery service to its subscribers. The company is now ready to offer this as an additional service and not as a substitution for any service now offered.

It asked for approval of rates covering such new service. The commission said that, in view of the fact that it is optional in that rates for such service are the same as the present rates or commensurate therewith, the application would be granted.

• • •

Handset Charges Reduced; Rate Case Discontinued

The New York Public Service Commission has granted special permission to the Rochester (N. Y.) Telephone Corp. to reduce the additional charge for handset telephones from 25 cents to 15 cents per month, effective November 1, and has discontinued and closed its investigation of the rates of the company which was brought on complaint of the mayor of the city of Rochester.

The complaint of the mayor of Rochester against the rates of the company was filed in 1933 and investigated by the commission whose engineering and accounting divisions examined the reports of the company to the commission for the years 1927 to 1934, inclusive. Hearings were delayed pending negotiations for a settlement of the case.

A report of Commissioner Maurice C. Burritt, approved by the commission, summarized briefly the results of the commission's investigation made in a previously filed detail report. It was shown that on the book value of the company's property and its revenues and expenses, as reported to the commission, it did not appear that a reduction in rates could be ordered at the present time. The company's net telephone earnings appeared to be well below a 6 per cent return on the book value of the property. While certain adjustments should be made, it did not appear that they would be sufficient to require a reduction in rates.

The reduction in the monthly charge for handset telephones is the result of negotiations carried on by the commission and will save the subscribers who

DAVEY LINE CLEARING SERVICE

More than 100% Increase in 1935

WHEN a big, healthy, husky, long-established service more than doubles in a single year—well, it must be "clicking" to the satisfaction of the folks who are buying it. The facts and figures make you or break you pretty fast in this business.

Buyers of line clearing service for telephone companies are mighty good business men, and careful. They buy Davey service for no sentimental reasons, but, instead, because they know that it gives them something more per dollar; lower unit costs, trouble-free lines, pleasing public relations, skillful workmanship, quick service in emergencies. The men, of course, are capable, experienced, likeable fellows.

The Davey line clearing service, 1935 model, got good mileage, thousands of miles of lines cheaply covered. The 1936 model will be equally efficient and smooth-running with appropriate new refinements and appointments.

You ought to try it some time. Just ask a Davey man to call.

THE DAVEY TREE EXPERT CO.

DAVEY TREE SURGEONS

OBITUARIES OF TWO TELEPHONE MEN

JOSEPH E. FARNSWORTH, retired vice-president of the Southwestern Bell Telephone Co. and former general manager of the company's Dallas, Texas, division, died in his sleep the night of October 18, as a result of a heart attack, at the home of his son, Austin M. Farnsworth in Long Beach, Calif. He was 73 years of age.

Since retiring from active service with the Bell System five years ago, Col. Farnsworth had been spending his winters in California, although making his permanent home in Dallas. He had been with the Southwestern Bell company and its predecessor, the Southwestern Telegraph & Telephone Co., for 45 years at the time of his retirement.

Col. Farnsworth first became affiliated with the Dallas exchange of the Southwestern Bell company, in 1896, going there from Austin, as superintendent of the company's north Texas division. At that time there were only 767 telephones in service in Dallas; when he retired from active service, the exchange had 71,000 subscribers. He was at one time engaged in newspaper work in Austin, Texas.

The deceased is survived by his widow and his son.

▲

DUDLEY H. KEYES, telephone engineer, died on November 9, at the Murray Hill Hospital, New York City, of heart disease. He was 51 years old.

After being graduated from the University of Chicago in 1905, Mr. Keyes entered the electrical engineering field and served in various positions with the Illinois Bell Telephone Co., the Michigan Bell Telephone Co. and the American Telephone & Telegraph Co. At the time of his death he was a structural protection engineer in the Bell Telephone Laboratories, and chairman of the structural coordination committee of the Edison Electric Institute.

He is survived by his widow, a son, Dudley H. Jr., and a daughter, Betty Jane, of Rockville Centre, L. I., N. Y.

use handset telephones a total of about $19,000 annually. There are about 16,000 handset telephones out of a total of 85,000 telephones in service in the territory of the Rochester company. This reduction brings the total rate reductions made by the company this year to $21,000.

The reduced rate for handset instruments is to be made effective in the entire territory of the company which includes the city of Rochester and immediate vicinity and the villages of Pittsford, Webster and Honeoye Falls in Monroe County and Perry in Wyoming County.

• • •

Company Seeks to Invade Bell Rural Territory

The Craig Telephone Co. has asked the Nebraska State Railway Commission for permission to invade rural territory occupied by lines of the Northwestern Bell Telephone Co., and has been notified that a hearing must be held. For four miles in the farming section, the lines of the Northwestern Bell company, reaching out of its Oakland exchange, parallel those of the Craig company. The farmers whom the Craig company desires to serve, are located some distance from where the two lines branch off from one another in Bell territory.

The commission is committed to the doctrine that unless good cause is shown, existing service in rural territory must be observed. The Craig company says the prospective patrons want its service and not that of the Bell, and that the latter has no subscribers in the disputed section. The Northwestern Bell company has offered to sell its lines, but the Craig company says the price is too much.

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Commission Rulings and Schedule of Hearings

FEDERAL COMMUNICATIONS COMMISSION (TELEPHONE DIVISION)

Washington, D. C.

November 25: Rehearing in Washington, D. C., on application of the American Telephone & Telegraph Co for permission to construct an experimental coaxial cable from New York to Philadelphia for broad band transmission.

January 14: Hearing in Washington, D. C., on citation against the Chillicothe (Ohio) Telephone Co. to show why it should not furnish information asked by the FCC. If the company should file "full and complete" responses to the commission's six orders, as required, the hearing would be dispensed with.

CALIFORNIA RAILROAD COMMISSION

October 29: Application filed by the Los Gatos Telephone Co. for authority to sell 1,500 shares of capital stock at par value of $10 per share. The proceeds are to be used in payment of note outstanding and to make certain improvements to plant.

October 30: Application filed by The Pacific Telephone & Telegraph Co. for permission to publish, file, and place in effect exchange, interexchange and telegraph rates at Avenal, Kings County.

October 31: Ripon Telephone Exchange seeks authority to replace its note, real estate mortgage, and chattel mortgage with note, deed of trust and chattel mortgage.

FLORIDA RAILROAD COMMISSION

October 29: Southern Bell Telephone & Telegraph Co. ordered to increase its allowance for messages on Miami business telephones from 70 to 90 messages a month. This, the commission estimated, will result in a saving of $5,000 annually to Miami subscribers using this type of service. The flat charge is $5.50 a month and five cents for each additional message over the number allowed.

ILLINOIS COMMERCE COMMISSION

November 13: Hearings in Chicago in the matter of proposed change in rates of the Farmers New Era Telephone Co.; the Illinois Valley Telephone Co., applying to all its exchanges; the Illinois Telephone Co., applying to all its exchanges; the Automatic Home Telephone Co., and the Northwestern Illinois Utilities Co.

November 14: Hearing in Chicago on complaint of the Clearing Industrial Association, et al, claiming unjust and unreasonable charges for telephone service furnished by the Illinois Bell Telephone Co. to complainants in the Chicago exchange area.

November 20: Continued hearing in the matter of the application of the Illinois Commercial Telephone Co., of Springfield, for permission to include the sales tax in its bills to subscribers.

KENTUCKY PUBLIC SERVICE COMMISSION

October 30: Authority granted the Ashland Home Telephone Co. to issue $250,000 worth of bonds to finance the purchase of some recently-acquired properties.

MISSOURI PUBLIC SERVICE COMMISSION

December 17: Hearing on complaint filed November 7 by citizens of Ulman and Iberia against the Citizens Public Service Co. of Missouri and Ozark Central Telephone Co. claiming unsatisfactory telephone service between Ulman, Iberia and Tuscumbia.

NEW YORK PUBLIC SERVICE COMMISSION

November 13-15: Hearing in New York before Commissioner Brewster in the investigation of the rates and practices of the New York Telephone Co.

SOUTH DAKOTA RAILROAD COMMISSION

November 5: The commission granted permission to C. L. Clendenning to close the exchange operated at Esmond under the name of the Esmond Telephone Co., it appearing that but two subscribers are now paying rental and that the six service stations now switched at Esmond are also connected to the Iroquois exchange, from which they are obtaining switching service. F-1776.

WISCONSIN PUBLIC SERVICE COMMISSION

November 7: Continued hearing in rate inquiry of the Wisconson Telephone Co.

Laboratory Tested

Telephone Wire

RUBBER COVERED
COPPERWELD - BRONZE - COPPER
DROP - INSIDE and BRIDLE

WB

MANUFACTURED BY

The Whitney Blake Co.

SOLE SELLING AGENTS IN U. S. A.

GraybaR
ELECTRIC COMPANY

FOREIGN DISTRIBUTORS: *International Standard Electric Corporation*, 67 Broad St., N. Y. C.

"Telephony's" Engineering Data

By B. C. Burden

Index, Subscriber Set Repair.
Nov. 16, 1935.
No. 9-C, Page 4.

The anti-side tone circuit, as the name implies, is intended to reduce the effect due to the transmitter picking up the extraneous noises of the operating room. At the same time the circuit is so arranged as to increase the transmission efficiency of the outgoing circuit to the subscriber. This is accomplished by using two induction coils with primary windings in parallel and secondary windings in series, Fig. 4-B.

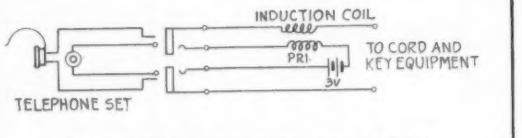

FIG. A. ORDINARY INDUCTION COIL CIRCUIT.

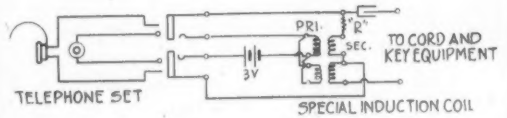

FIG. B. ANTI-SIDE TONE CIRCUIT

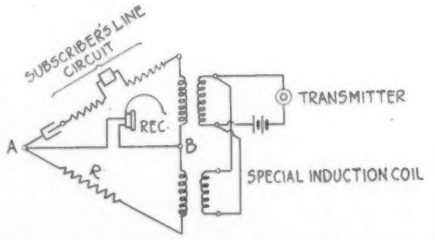

FIG. C. SCHEMATIC OF ANTI-SIDE TONE OPERATOR'S TELEPHONE SHOWING RELATION TO SUBSCRIBER'S LINE CIRCUIT.

FIG. 4. OPERATORS' TELEPHONE SET CIRCUITS.

"Telephony's" Engineering Data

By B. C. Burden

Index, Subscriber Set Repair.
Nov. 16, 1935.
No. 9-C, Page 5.

The anti-side tone feature is obtained in this way: Referring to Fig. 4-C, it will be seen that the resistance *R*, the subscriber's line circuit, and the two secondary windings form the sides of a Wheatstone bridge circuit, with the receiver connected across the points of equal potential, *A* and *B*.

The result is that the voice currents induced in the secondary windings as the result of similar currents flowing in the primary will not affect the operator's receiver; provided that the resistance, *R*, is equal to the impedance of the subscriber's line. (This last condition is, of course, difficult to obtain exactly. Under ordinary circumstances the current through the receiver, as the result of this unbalance, will be much less than if this arrangement were not used.) The subscriber's voice currents, on the other hand, pass through the receiver with ample energy to produce satisfactory response of the receiver.

The anti-side tone arrangement is especially useful in noisy locations as in the larger magneto and common battery offices and private branch exchanges. It helps to improve the operator's efficiency by reducing the masking effect created by the room noise, which might otherwise cause her to misunderstand subscribers in communication with her.

Another type of anti-side tone induction-coil unit has the two secondary and primary coils wound on a common core together with the resistance *R*, making a more compact unit. In addition, an extra winding may be utilized for monitoring purposes by the chief operator. This is usually done in larger offices having a number of positions where an accurate method of checking the operating practices of each person at her position is necessary.

Maintenance of Operators' Telephone Sets

As was pointed out at the beginning of this data sheet, defects occurring in operators' telephones because of neglect or improper care, may result in the lowering of the quality of service to the subscribers, such as errors in making connections and unnecessary holding up of other lines. Such defects would obviously be serious if they occurred in sets used on toll positions.

The following instructions for the care of operators' telephone equipment apply to the breastplate type. However, modifications of the methods outlined may be made in the case of sets using a suspended transmitter. Also the methods may be altered to suit the size of the exchange and the number of positions. For example, in the smaller exchanges, it will probably be unnecessary to make frequent repairs to operators' telephones, owing to less severe handling of these units.

The important point is that each operator's telephone set should receive the same careful and regular attention that is given the cord and key equipment of the switchboard.

Since each operator should have her own individual head telephone set, and since the maintenance of these units is best accomplished away from the switchboard, extra sets

"Telephony's" Engineering Data

By B. C. Burden

Index, Subscriber Set Repair.
Nov. 16, 1935.
No. 9-C, Page 6.

should be kept on hand ready for immediate use. This might not seem necessary in the small magneto exchange that utilizes this type of set; but one extra telephone set kept in readiness may save annoyance and loss of time when an emergency arises and it is found that the unit in regular use is not up to standard.

Each operator should be instructed in the care of her telephone, for carelessness on her part can do more damage to it than ordinary use alone. The provision of a convenient place for the storage of her head telephone set during the time she is off duty will do much towards encouraging the operator to take good care of it.

For the larger offices, a row of individual compartments, in which the sets can be deposited, may be located in some convenient place in the operating room; such an arrangement is illustrated in Fig. 5. Each compartment is numbered and assigned to an operator for her regular use.

In the matter of maintaining operators' telephone sets, a

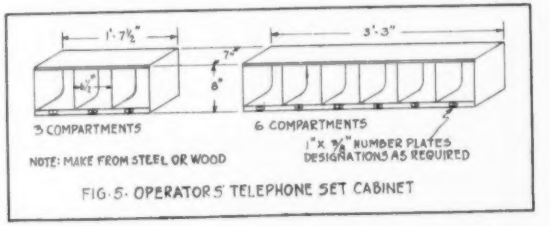

FIG. 5. OPERATOR'S TELEPHONE SET CABINET

regular routine should be set up for doing this. This should consist of inspecting, repairing, and testing the sets. Repairs to the sets should be made as the inspection progresses, each fault being corrected as it is discovered, to prevent the possibility of defects being overlooked.

This step-by-step routine is outlined as follows:

The cords should be examined for a frayed, dirty or greasy condition. Frayed cords should be discarded as they are likely to be noisy. Dirty cords can be easily cleaned with a good grade of gasoline or cleaner's naphtha, applied on a cloth and followed by wiping with a clean, dry cloth.

The cord plug should not be so worn as to cause cut-outs. This condition can be easily determined by moving the plug in the jack of the test set and listening in the receiver. (Note: It might be well to check the condition of the telephone jack in the switchboard to make sure that worn or improperly adjusted springs are not causing the trouble attributed to a worn or damaged plug.)

For certain types of plugs, such as those having two conductors per prong, a gauge similar to that utilized for switchboard cord plugs should be used to check the condition of the plug.

The Manufacturers' Department

New Officers of Burgess Laboratories

C. F. Burgess Laboratories, Inc., Madison, Wis., announces that marking the close of 25 years of its corporate existence, the office of chairman of the board has been created. C. F. Burgess has been elected to this office, and Arba B. Marvin, of New York, has been elected president.

Mr. Marvin, as a participant in the organization of the laboratories, and as its attorney for more than 20 years, is thoroughly familiar with the Laboratories' purpose of doing scientific research on a commercial basis.

• • •

Dial Automatic Service for Montgomery, N. Y.

The Montgomery exchange of the Walden (N. Y.) Telephone Co. was cut-over to dial automatic operation on Saturday, November 2, in the presence of the officials of the Walden company and an interested group of engineers from other New York state operating companies. The cut-over was accomplished by the local operating men under the direction of Manager H. R. Miller and was effected very smoothly, no interruptions in service or cases of trouble being encountered.

At a banquet which was held previous to the cut-over, Fred Fowler, president of the Walden Telephone Co., together with N. F. Glidden, vice-president, and Roger Zanes, secretary of the Walden Telephone Co., were hosts to the visiting engineers who had come to see the cut-over of the Montgomery exchange.

Prominent among the visitors were: Frank Fancher, vice-president, and Ed Davenport, equipment engineer of the Orange County Telephone Co. of Middletown; F. H. Florence, plant superintendent of the Highland Telephone Co. of Monroe; Wesley Knight, division plant agent of the New York Telephone Co. at Albany; A. Elmsdorf, manager of the New York Telephone Co. at Newburg; and R. C. Arter, chief engineer of the North Electric Mfg. Co., Galion, Ohio, who represented the manufacturers of the new automatic equipment.

Mayor Jennings, of Montgomery, was present in behalf of the people of Montgomery to congratulate the telephone company on its new service.

The new equipment is a North all-relay dial automatic switchboard equipped with 90 lines and 10 links. The new switchboard possesses all of the latest North features such as line lock-out and link conversation disconnect.

The new exchange, which is operated on the unattended basis, serves about 250 subscribers. All toll and information calls are handled from the Walden exchange, which is the headquarters of the company.

The Walden Telephone Co. was established in 1903 as the Hudson River Telephone Co. In 1910 the name of the company was changed to the present one.

• • •

Card System for Social Security Act Data

The business man realizes that the best and most economical way to handle a situation which he expects will confront him is to be properly prepared. What is the best way in which to prepare to meet the requirements of the Federal Social Security act and various acts of the several states?

Many articles have been published in newspapers and magazines about the acts; however, little if anything has been said as to how to be prepared to meet them at the least possible cost to the business enterprise.

The Corporation Tax Service, 4753 Broadway, Chicago, through its specially-trained tax accountants, has made a careful study of the Social Security acts and devised a simple, yet complete, card system which will give the necessary information to comply with their requirements. The system serves as a complete and permanent record, to be preserved for inspection by government agents, and provides for the compilation of the necessary data to be used in gathering the information for both the Federal and state returns.

The Corporation Tax Service furnishes the cards and supervises the installation of the system. Later the organization provides assistance in the preparation of the necessary tax returns and stands ready to offer advice and be consulted with in this connection.

• • •

Automatic Equipment for U. S. Marine Barracks

Announcement has been made by G. B. Foscue, chairman of the board of American Automatic Electric Sales Co., of the receipt of an order for a 900-line Strowger automatic telephone exchange to be installed at U. S. Marine Barracks, Quantico, Va. The equipment will be

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FIG. 4.. OPERATORS' TELEPHONE SET CIRCUITS

Since each operator should have her own individual head telephone set and since the maintenance of these units is best accomplished away from the switchboard, extra sets ductors per prong, a gauge similar to that utilized for switchboard cord plugs should be used to check the condition of the plug.

engineered and manufactured by Automatic Electric Co., Chicago.

A unique specification requirement of this order is that in addition to supplying switching equipment for full-automatic central-office service, including trunk connections to both public and private long distance lines, several "special service" facilities are to be provided, including discriminating (restricted) trunk service, fire-reporting service with calling line identification, executive direct-line service, and progressive conference call service.

The switching equipment will be of the Strowger line-finder type. A total of 900 line and cutoff relays, 70 finder switches, 70 first selector switches, three special second selector switches, two reverting call switches and 70 connector switches are included. Conventional traffic meters will provide for the registration of traffic peg counts, all-trunks-busy conditions, and overflow calls.

Provision will be made for full-selective, divided-ringing, two-party line service on a terminal-per-line basis, the telephone ringers being connected to either side of the line and ground. Ringing current of approximately 19-cycle frequency will be supplied from a rotary type ringing generator.

Each group of connector switches will serve two 100-line groups. This is accomplished by equipping each connector with 200-point line banks. The telephone numbers will consist of four digits. The first digit selects the connector group in which the desired line is located; the second digit selects the proper 100-line unit of the connector group, and also determines the side of the line (+ or —) over which the ringing current will be sent; and the last two digits select the desired line in the particular hundred group. Reverting calls on party lines may be made by dialing the two-digit code "19."

Two groups of long distance lines will be associated with the automatic exchange; one group, known as "commercial," leading to the public-exchange network and the second group, known as "Navy," leading direct to Navy headquarters in Washington, D. C. Connections to and from these lines will be completed through a one-position toll switchboard to be located in the automatic switchroom.

Outgoing service from the Quantico automatic exchange to these long distance lines will be handled on a discriminating, or restricted, basis. Three hundred of the local lines will be automatically restricted to local service. A second group of local lines (200 in number) will be permitted connections to the commercial long distance lines, and may obtain a trunk to the toll switchboard by dialing "9." A third group of local lines (400 in number) can obtain connections to the commercial lines by dialing "9," and to the Navy line by dialing "8."

The power plant includes a power board, a 46-volt storage battery, charging equipment and ringing machines. Charging equipment consists of a 12-ampere rectifier designed to care for normal traffic loads, and a 25-ampere motor-generator set for use during the periods of peak traffic.

Two rotary type ringing machines will be provided: one a 45-watt machine operating from the commercial power circuit; and the other a 30-watt machine designed to operate on direct-current supplied by the storage battery. Both machines generate ringing current of approximately 19-cycle frequency, and failure of the 45-watt A. C. machine will automatically switch in the 30-watt machine operating from storage battery.

Two special trunk circuits to fire headquarters will provide means for reporting fires, access to either trunk being obtained by dialing "70." This will cause the associated repeater to place ringing current on the trunk for operating the alarm signal at fire headquarters.

Concurrently, a special line-finder switch in the automatic exchange will seek the calling line in an auxiliary group of special line relays, preparatory to sending in the number of the calling line to fire headquarters. When the calling line has been found, the associated number will be automatically

(*Concluded on page* 38)

SELF-IMPROVEMENT

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

MOST PEOPLE are interested in improving themselves in one way or another, although it is hard to believe of some folks. If we could read their innermost minds we might be surprised and ashamed of our doubt. The fall of the year seems to me to be the best time to start doing something definite in the way of self-improvement.

It is not enough that we serve others day after day at our switchboards. Of course, our work does aid in building our character because it teaches us patience, kindliness, consideration for the people in our community; and self-denial, too, for operating schedules must, of necessity, be drawn to provide employes enough to serve the public day and night. Naturally, many of the tricks have at least one undesirable meal. There are the evening tricks to be worked by some of us while the rest of the world is out pleasure hunting. When Sundays and holidays roll around, we must take our turn at the switchboard when assigned to duty.

All of this goes a long way toward our individual character growth, but it is not all we need, for, "As turning the logs will make a dull fire burn, so changes of studies a dull brain."—Longfellow.

Not long ago I met the chief operator who told me that several of her operators were taking a course of study given by a better speech institute in Chicago, and were very much interested in the course. There are so many courses of different kinds that we can almost have our choice nowadays.

I know of women who attend knitting classes; others, cooking classes. The Book Club is probably the best, according to my notion. But, of course, everyone to his notion.

MORAL: "As land is improved by sowing it with various seeds, so is the mind by exercising it with different studies."

JOHN M. COOK
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Specializing in toll compensation matters—for the better part of twenty-nine years.
Standard Bldg. ATLANTA, GA.

Buyer's Weekly Guide

A list of firms and companies offering equipment, supplies or services for operating telephone companies

ADDING MACHINES

Burroughs Adding Machine Company, Second Blvd., Detroit, Mich. — Adding, Bookkeeping, Calculating, Billing and Accounting Machines, Electric Carriage Typewriters, Standard Typewriters, Operator Correct-Posture Chairs. Burroughs machines are in use today in hundreds of progressive telephone companies throughout the country.

BATTERIES—DRY CELLS

Burgess Battery Co., Freeport, Ill.—Burgess Flashlights and Uni-Cel Flashlight Batteries—for dependability and service. The Burgess Twin-Six Telephone Battery—a 2-volt unit designed to replace two No. 6 cells, with longer life, lighter weight, smaller size and a leakproof case. The Burgess Little-Six—replaces the old type No. 6 cell, is smaller and lighter, will not ooze or bulge, has all the electrical capacity of the standard No. 6 cell.

National Carbon Company, 30 E. 42nd St., New York.—"Columbia" Telephone Dry Batteries; "Eveready" Flashlights, Flashlight Batteries and Long Life Dry Cells, "National Pyramid" brushes, carbon, graphite and metal graphite for motors, generators and rotary converters. "Eveready" Prestone anti-freeze; "Eveready" Rustone rust preventive; and "Eveready" Air Cell telephone operators' transmitter batteries.

Ray-O-Vac Company, Madison, Wis.—Ray-O-Vac telephone batteries — longer life and better service proven by tests in accordance with U. S. Government standards and records of users. Ray-O-Vac flashlights and industrial flashlight batteries are other items showing Ray-O-Vac's outstanding quality.

BATTERIES—STORAGE

The Electric Storage Battery Company, Allegheny Ave. and 19th St., Philadelphia, Pa.—Exide Storage Batteries. Branches: Boston, New York, Rochester, Philadelphia, Pittsburgh, Washington, Atlanta, Cincinnati, Cleveland, Detroit, Chicago, Kansas City, Minneapolis, St. Louis, Denver, San Francisco and Seattle.

Philco (Battery Division) Tioga and C Streets, Philadelphia, Pa. — Philco- Steel Glass Storage Batteries for P.B.X and central office operation. Your old batteries will command a liberal allowance toward any Steel-Glass cell from 10 A.H. to 1040 A.H. Write now for catalog . . . it will tell you the complete story of Steel-Glass—the finest of Telephone Batteries.

BATTERY CHARGING EQUIPMENT

General Electric Company, Bridgeport, Conn.—Tungar battery chargers. G-E pole line hardware. Cable filling compound.

CABLE—LEAD ENCASED

American Electrical Works, Philipsdale, R. I.—Paper telephone cable, switchboard cable, bare copper wire. Chicago Office: 20 N. Wacker Drive; Cincinnati: Traction Bldg.; New York: 100 E. 42nd St.

British Insulated Cables, Ltd., Surrey House, Embankment, W. C. 2. Factory: Prescot, Lancashire, England.—Telephone cable of all sizes and capacities.

General Cable Corporation, 420 Lexington Ave., New York, N. Y.—Paper telephone cables of standardized manufacture for over forty years. Weatherproof and insulated copperweld drop wire.

Eugene F. Phillips Electrical Works, Ltd., Montreal, Can.—For any type of wire or cable used in telephone, telegraph or power work get in touch with "Phillips." Manufacturers of bare and insulated copper wires, rubber insulated wires, enameled wire, magnet wire, telephone cables, power cables, switchboard cables, flexible cords, copper rods, etc.

CABLE RINGS

National Telephone Supply Company, 5100 Superior Ave., Cleveland, Ohio.—National Cable Rings, National Splicing Sleeves, Non-Breakable Messenger Cable Hangers, Marlin and Swisher Cable Hangers and Custom Galvanizers. National cable rings are practical because they are two-way,—they allow the cable to be pulled in either direction. National sleeves make secure the weakest points in the line. If it's a splice—make it a National.

CABLE TERMINALS

Cook Electric Company, 2700 Southport Ave., Chicago, Ill.—Protective Pole Cable Terminals, Unprotected Pole Cable Terminals, central office protection, lighting arresters, sleeves, fuses.

Reliable Electric Company, 3145 Carroll Ave., Chicago, Ill.—Complete line of cable terminals, telephone and switchboard protectors, sleeves, fuses, solderless wire connectors and specialties.

CARBON DIAPHRAGMS

Noris Carbon Company, Inc., 160 5th Ave., New York, N. Y.—Carbon diaphragms, carbon back plates, granular and globular carbons, lightning arresters.

CONDUIT

Brazil Hollow Brick & Tile Company, Brazil, Ind.—Makers of Brazil Vitrified Tile. Conduit.

CORDS, CABLE AND WIRE

Lenz Electric Manufacturing Co., 1751 N. Western Ave., Chicago—Established 1904—telephone and switchboard cords for all makes of equipment, braided and lead-covered telephone cable, flame-proof jumper wire, interior telephone wire, switchboard wire.

CORDS AND WIRE

Runzel Cord & Wire Co., 4727-31 Montrose Ave., Chicago—Telephone and Switchboard Cords, Flame-proof Jumper Wire, Switchboard Wire, Interior Telephone Wire. W. L. Runzel, President, has devoted over 40 years to the making of fine telephone cords.

ELAPSED TIME RECORDERS

Calculagraph Company, 50 Church St., New York, N. Y.—Calculagraph is the world's standard elapsed time recorder and gives you toll records printed with elapsed time to the second. Both spring driven and electric motor models are available.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

Alfred E. Cowling, Scotstown, Quebec.—Eastern cedar poles, plain or butt treated.

International Creosoting and Construction Company, Galveston, Texas—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

Jordan Bros. Lumber Co., Box 84, Norfolk, Va.—Virginia White Cedar Poles. Plain or charred and creo-treated butts.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

Michigan Pole & Tie Company, Newberry and Grand Rapids, Mich. — "Poles with Character." Northern White and Western Red Cedar. Strategically located yards, Minneapolis, Minn., and Reed City (Lower Michigan), insure quick deliveries.

Naugle Pole & Tie Co., 5 South Wabash Ave., Chicago, Ill. Northern White and Western Red Cedar Poles. Plain or butt-treated. Let us quote you our new low prices.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada — Western Red Cedar Poles. Plain or Butt treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or Butt treated.

SUPPLIES, SWITCHBOARDS AND INSTRUMENTS

American Automatic Electric Sales Company, 1033 West Van Buren Street, Chicago, Ill.—Public Automatic Telephone Systems, Private Automatic Telephone Systems, Central Battery and Magneto Manual Telephone Switchboards, Remote Control Switchboards, Telephone Instruments of all types, Battery Eliminators, Charging Equipment, Signaling and Control Apparatus, Cords, Wires, Cables, Monotype Copperweld Drop Wire, and a complete line of construction materials and supplies.

Automatic Electric Company, 1033 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Telephones, relays, signaling and control equipment.

Automatic Electric Company, Ltd., Milton Road, Edge Lane, Liverpool, England.—Automatic Telephone Equipment.

Automatic Electric Sales Company, Ltd., 1027 W. Van Buren St., Chicago, Ill.—Public Automatic Dial Systems, Private Automatic Dial Systems, Manual Telephone Equipment, telephones, storage batteries, wire, cable, poles, etc.

Kellogg Switchboard & Supply Company, Adams & Aberdeen Sts., Chicago, Ill.—Engineers and designers, manufacturers and suppliers of complete equipment for telephone exchanges and communication systems. Manufacturers of "Master-built" Common Battery, Magneto and PBX Switchboards, "Masterphone" Telephone Instruments, and a complete line of telephone supplies, including bronze drop and interior wire.

North Electric Manufacturing Company, Galion, Ohio—Machine switching telephone systems. Automanual and Automatic. "All-Relay" Switching Apparatus (Dialless and Dial Control). Unattended Satellite Systems.

Siemens Brothers & Company, Ltd., Woolwich, England—Automatic and Manual Telephone Equipment.

Stromberg-Carlson Telephone Manufacturing Company, 100 Carlson Road, Rochester, N. Y. — Telephone apparatus of all kinds, switchboard cords, cable and general telephone supplies.

TOOLS

Crescent Tool Co., Jamestown, N. Y.—CRESTOLOY Pliers, Curved Needle Nose Pliers, Heavy Diagonal Cutting Pliers, Linemen's Side Cutting Pliers, End Cutting Nippers, Crescent Hack Saws.

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These are NOT "used" or "rebuilt" stands. They are completely remanufactured in the Suttle factory so they are just like new. Completely guaranteed.

We bought a big lot of these at an unusual price and are passing them on to you at practically the cost of re-manufacturing. If they aren't the Best Buy you ever made, send them back and we'll cancel the charges.

SUTTLE EQUIPMENT CO.
LAWRENCEVILE, ILLINOIS

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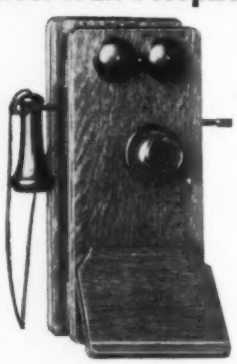

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Dean	$5.00
Kellogg 3A	5.00
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Telephone Repair Shop
Rogers Park Station — Chicago

POSITIONS WANTED

POSITION WANTED by experienced telephone man; magneto or common battery. Switchboard or equipment. Married; sober. Go anywhere. Address Claude R. Wiandt, % S. C. Pearson, Jackson, Tenn.

EXPERIENCED line, switchboard and instrument repair man wants work. Independent company. Good reference. Will go any place. Address 8487, care of TELEPHONY.

POSITION WANTED—Young man, telegraph and telephone inside maintenance and engineering experience. Have excellent record in Bell, foreign and international service. Address 8488, care of TELEPHONY.

POSITION WANTED — Commercial representative, 7 years with Bell System, university graduate, age 32, capable, aggressive, thoroughly familiar with business office and sales practices. Address 8483, care of TELEPHONY.

FIRST CLASS CABLE SPLICER, experienced in all kinds of plant work, wants position; 15 years' experience. Address 8480, care of TELEPHONY.

(*Concluded from page* 36.)

transmitted over the trunk to fire headquarters where it will be punched on a tape register. Release of the call is under the control of fire headquarters.

When a fire call has been received, the alarm may be extended to a group of 15 pre-assigned lines for the purpose of dispatching firemen. Operating a key at fire headquarters will cause apparatus in the automatic exchange to ring the 15 lines simultaneously. As each fireman answers the call, an associated supervisory lamp at headquarters will indicate the answering line.

One telephone station will be equipped with an executive key cabinet for direct service to a total of 25 pre-assigned lines without requiring the dialing of the line numbers. The cabinet contains 25 keys, one key for each assigned line. To connect with any line, the particular key in the cabinet is operated which will cause the bell of the associated line to ring continuously until answered.

A low-toned buzzer in the cabinet will sound as an indication that the line is being signaled. When the called line answers, the Monophone handset at the calling station is lifted from the cradle to complete the connection. If the desired line is busy when the key is operated, the ringing will be delayed until the line is freed from the previous connections.

One telephone station will be equipped for calling progressively any number of lines in a pre-assigned group of 20 lines or less, and to connect them to a common talking circuit for conference purposes. A conference may be established by dialing two-digit codes associated with the desired lines in the group. As each person answers, he is instructed to wait on the line, and the conference may commence as soon as the last person answers.

No telephones other than those called can enter the conference, but additional stations may be called in during the conference, and conferees may withdraw at will. The conference call apparatus in the automatic exchange is released when the Monophone handset at the calling station is returned to the cradle.

• • •

A. T. & T. Co. Stockholders Less in Number

The American Telephone & Telegraph Co. had 664,000 holders of its 18,662,275 shares of outstanding capital stock at the end of October, a decline of about 11,000 since January 1. Average holdings are now 28.1 shares. At the end of 1932 there were more than 700,000 stockholders with 18,662,275 shares outstanding, or an average of 26.6 shares to a stockholder.